# DIFFERENTIATING TEACHER PERFORMANCE IN AN URBAN SCHOOL SYSTEM BASED ON PERSONNEL FILE DATA

By

DALTON D. EPTING

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF EDUCATION

UNIVERSITY OF FLORIDA

1986

# ACKNOWLEDGEMENTS

Many people were very helpful during the extended period of preparation of this manuscript. Special appreciation is extended to the members of my doctoral committee who helped to keep this dissertation in perspective and encouraged me until it was completed.

Dr. Ralph B. Kimbrough, my committee chairman, and highly respected educator, was a guiding force in my professional development. I will always be grateful for his assistance and guidance.

Dr. Michael Nunnery's superb talents as an instructor and genuine concern for the development of his students set an example that I will not forget.

Dr. David Jacobsen was especially helpful in defining and refining the research problem. He is a very fine educator who was supportive while demanding quality work.

In addition to my doctoral committee, Dr. John Gillespie, Dr. Logan Cross, and Howard Winesett, all of the Research and Evaluation Division of the Duval County School Board, provided invaluable consultative and technical assistance for which I am extremely grateful.

A final note of appreciation is extended to my family for their patience and understanding. Without the encouragement and support of my wife and children the doctoral program would not have been as meaningful.

# TABLE OF CONTENTS

ACKNOWLEDGEMENTS . . . . . . . . . . . . . . . . . . . . . ii

LIST OF TABLES . . . . . . . . . . . . . . . . . . . . . . v

ABSTRACT . . . . . . . . . . . . . . . . . . . . . . . . . vii

CHAPTER

I INTRODUCTION . . . . . . . . . . . . . . . . . . . . 1

- The Purpose . . . . . . . . . . . . . . . . . . . . 3
- Limitations and Delimitations . . . . . . . . . . . 4
- Significance of the Study . . . . . . . . . . . . . 5
- Definition of Terms . . . . . . . . . . . . . . . . 10
- Organization of the Remaining Chapters . . . . . . . 14

II REVIEW OF RELATED LITERATURE . . . . . . . . . . . . 15

- Characteristics of Those in the Teaching Profession 15
- Age and Experience as Factors of Teacher Effectiveness . . . . . . . . . . . . . . . . . . 21
- Sex as a Factor of Teacher Effectiveness . . . . . . 25
- Knowledge of Subject Matter, Intelligence, and Grade Point Average as Factors of Teacher Effectiveness . . . . . . . . . . . . . . . . . . 27
- Type of Higher Educational Institution as a Factor of Teacher Effectiveness . . . . . . . . . 30
- Early Education and Personal Background as Factors of Teacher Effectiveness . . . . . . . . . 32
- Mobility as a Factor of Teacher Effectiveness . . . 34
- Generalizations from the Literature . . . . . . . . 35

III METHODS AND PROCEDURES . . . . . . . . . . . . . . . 37

- Selection of Teacher Participants . . . . . . . . . 37
- Data Collection and Coding . . . . . . . . . . . . . 38
- Data Analysis and Study Design . . . . . . . . . . . 42

IV ANALYSIS OF THE DATA . . . . . . . . . . . . . . . . 47

- Correlation of Variables . . . . . . . . . . . . . . 48
- Data Analysis Relative to Elementary Teachers . . . 51
- Data Analysis Relative to Secondary Teachers . . . . 55
- Data Analysis Relative to Black Teachers . . . . . . 59
- Data Analysis Relative to White Teachers . . . . . . 62
- Data Analysis Relative to Male Teachers . . . . . . 65

Data Analysis Relative to Female Teachers . . . . . 69
Data Analysis Relative to All Teachers. . . . . . . 73
Summary . . . . . . . . . . . . . . . . . . . . . . 77

V SUMMARY, FINDINGS, CONCLUSIONS, DISCUSSION, AND SUGGESTIONS FOR FUTURE RESEARCH . . . . . . . . . 81

Summary . . . . . . . . . . . . . . . . . . . . . . 81
Findings. . . . . . . . . . . . . . . . . . . . . . 84
Conclusions . . . . . . . . . . . . . . . . . . . . 87
Discussion. . . . . . . . . . . . . . . . . . . . . 88
Suggestions for Future Research . . . . . . . . . . 90

REFERENCES. . . . . . . . . . . . . . . . . . . . . . . 93

BIOGRAPHICAL SKETCH . . . . . . . . . . . . . . . . . . 99

## LIST OF TABLES

Table

1 Code Assignments for Discriminating and Group Membership Variables. . . . . . . . . . . . . . . 43

2 Correlation Matrix for All Variables. . . . . . . . 49

3 Means and Standard Deviations of Selected Variables for Elementary Teachers with Competency Group Membership as Criterion. . . . . 51

4 Discriminant Analysis Coefficients for Elementary Teachers . . . . . . . . . . . . . . . 53

5 Classification Function Coefficients for LTS vs. MTS Elementary Teachers . . . . . . . . . . . . . 54

6 Means and Standard Deviations of Selected Variables for Secondary Teachers with Competency Group Membership as Criterion . . . . . . . . . . . . . 55

7 Discriminant Analysis Coefficients for Secondary Teachers. . . . . . . . . . . . . . . . 57

8 Classification Function Coefficients for LTS vs. MTS Secondary Teachers. . . . . . . . . . . . . . 58

9 Means and Standard Deviations of Selected Variables for Black Teachers with Competency Group Membership as Criterion . . . . . . . . . . . . . 60

10 Discriminant Analysis Coefficients for Black Teachers. . . . . . . . . . . . . . . . . . . . . 61

11 Classification Function Coefficients for LTS vs. MTS Black Teachers. . . . . . . . . . . . . . . . 62

12 Means and Standard Deviations of Selected Variables for White Teachers with Competency Group Membership as Criterion . . . . . . . . . . . . . 63

13 Discriminant Analysis Coefficients for White Teachers. . . . . . . . . . . . . . . . . . . . . 64

14 Classification Function Coefficients for LTS vs. MTS White Teachers. . . . . . . . . . . . . . . . 65

15 Means and Standard Deviations of Selected Variables for Male Teachers with Competency Group Membership as Criterion . . . . . . . . . . . . . 67

16 Discriminant Analysis Coefficients for Male Teachers. . . . . . . . . . . . . . . . . . . . 68

17 Classification Function Coefficients for LTS vs. MTS Male Teachers . . . . . . . . . . . . . . . 69

18 Means and Standard Deviations of Selected Variables for Female Teachers with Competency Group Membership as Criterion . . . . . . . . . . . . . 70

19 Discriminant Analysis Coefficients for Female Teachers. . . . . . . . . . . . . . . . . . . . 72

20 Classification Function Coefficients for LTS vs. MTS Female Teachers . . . . . . . . . . . . . . . 72

21 Descriptive Statistics of Selected Variables for All Teachers. . . . . . . . . . . . . . . . . . 73

22 Means and Standard Deviations of Selected Variables for All Teachers with Competency Group Membership as Criterion . . . . . . . . . . . . . 75

23 Discriminant Analysis Coefficients for All Teachers. . . . . . . . . . . . . . . . . . . . 76

24 Classification Function Coefficients for LTS vs. MTS Teachers. . . . . . . . . . . . . . . . . . 77

25 Mean Scores of Discriminating Variables and Order of Differentiation for Each of the Seven Groups Investigated. . . . . . . . . . . . . . . . . . . 78

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Education

# DIFFERENTIATING TEACHER PERFORMANCE IN AN URBAN SCHOOL SYSTEM BASED ON PERSONNEL FILE DATA

By

Dalton D. Epting

December, 1986

Chairman: Ralph B. Kimbrough
Major Department: Educational Leadership

The purpose of this study was to distinguish between less-than-satisfactory teachers and more-than-satisfactory teachers in terms of educational, experiential, and demographical variables that would be readily discernible at the time of initial employment.

A large urban school district in North Florida was the context of this study. Data were collected on 323 classroom teachers, of whom 157 were classified as less-than-satisfactory and 166 were classified as more-than-satisfactory. Variables selected for study included grade point averages, teaching experience, other work experience, mobility, early educational experience, and type of college attended.

Discriminant analysis was used to determine how well the selected variables discriminated between the more-than-satisfactory and less-than-satisfactory teachers as a total group as well as for the subgroups black, white, male, female, elementary, and secondary. The stepwise procedure was used to select the most useful of the discriminating variables. The criterion for selection or removal of variables was set at 1.0 or greater for the value of the overall F ratio for the test of differences between group centroids.

The major conclusions were as follows:

1. Selected educational, experiential, and demographical variables discriminated between less-than-satisfactory and more-than-satisfactory teachers for each of the subgroups investigated.

2. The list of variables that discriminated significantly and the accuracy of discrimination were dependent upon the subgroup of teachers under investigation.

3. The two variables, mobility and grade point average, were strong indicators of differentiation for all subgroups of teachers.

# CHAPTER I
# INTRODUCTION

There is general agreement supported by much research that the effectiveness of an educational program is determined to a large extent by those who do the teaching (Hathaway, 1980; Kounin, 1970; Ryans, 1960; Stevens, 1979; Trentham et al., 1985). The characteristics of the teaching profession are influenced by the characteristics and qualities of those who are recruited, those who are selected from among those recruited, and those who are retained as continuing members from those selected. One might reasonably assume that if good teachers--those who are skillful at planning, instructional organizations, management of student conduct, and presentation of subject matter--were placed in each classroom, then society would benefit by moving into a more enlightened and productive era. The identification and placement of good teachers then becomes a task of great importance for the administration of any school system.

Teachers differ greatly. Some differences are observed in the way they behave. Some are friendly, sociable, and outgoing; others shy and withdrawn. Some are forceful, dominant; others meek and permissive. Some are constantly active, working with great intensity; others are lethargic. There are also differences in demographical and biographical background characteristics such as sex, age, family background, ability, skills, academic performance, and general intelligence. However, when the literature was reviewed to discover what makes a good teacher, few generalizations were found. According to Ornstein (1976), "few researchers agree upon which list or group of behaviors constitute a good or effective teacher, and lack of consensus has caused inconsistencies among the research findings" (p. 201).

The identification of the effective teacher has been a problem that has plagued educational leaders and personnel administrators for years and is yet to be resolved. The bulk of research concerning teacher effectiveness has dealt with teacher personality and behaviors as they affect student performance. The results of such research have been inconclusive and inconsistent and to date have not produced valid and reliable methods and/or instruments for predicting teacher effectiveness. The primary gain from research has been in methods for evaluating the performance of teachers in classrooms (Ryan & Phillips, 1982). Information from classroom evaluations is not readily available at the point where a decision is made on initial employment, and identification of incompetent teachers once they are in the classroom generates a loss in educational opportunity for students. The challenge to personnel administrators is to predict from a minimum amount of information which teachers are most likely to be successful.

Personnel administrators and school principals of the Duval County, Florida, Public School System (DCPSS) faced the same problems generally. The DCPSS was a large urban school district in which approximately 100,000 children were attending the public schools. During each of the school years 1981-82, 1982-83, 1983-84, and 1984-85 an average of 400 teachers from over 3000 applicants were employed ("Personnel Records," 1985). The criteria for selection were based primarily on a personal interview and file data collected prior to employment. The following question therefore arose: To what extent do the file data provide a basis for differentiating between potentially acceptable employees and potentially unacceptable employees? The response to the question focused the investigation.

## The Purpose

The purpose of the study was to distinguish between less-than-satisfactory (LTS) teachers and more-than-satisfactory (MTS) teachers in a large urban school district in terms of educational, experiential, and demographical variables that would be readily discernible at the time of initial employment. Specifically, answers to the following questions were sought:

1. To what extent do selected educational, experiential, and demographical variables discriminate between LTS elementary teachers and MTS elementary teachers?

2. To what extent do selected educational, experiential, and demographical variables discriminate between LTS secondary teachers and MTS secondary teachers?

3. To what extent do selected educational, experiential, and demographical variables discriminate between LTS black teachers and MTS black teachers?

4. To what extent do selected educational, experiential, and demographical variables discriminate between LTS white teachers and MTS white teachers?

5. To what extent do selected educational, experiential, and demographical variables discriminate between LTS male teachers and MTS male teachers?

6. To what extent do selected educational, experiential, and demographical variables discriminate between LTS female teachers and MTS female teachers?

7. To what extent do selected educational, experiential, and demographical variables discriminate between LTS teachers and MTS teachers?

## Limitations and Delimitations

1. All the background data gathered for the investigation related to LTS and MTS teachers who were employed in the DCPSS, Jacksonville, Florida, during the 1981-82, 1982-83, 1983-84, and 1984-85 school terms. MTS teachers were selected from those who were nominated at "Teacher of the Year" from their respective schools. All teachers rated unsatisfactory

on their annual evaluation or who were recommended for dismissal due to incompetency constituted the LTS teacher group. There were 157 teachers in the LTS category and 166 teachers in the MTS category.

2. The educational, experiential, and demographical data gathered were obtained from personnel file documents that were provided by the teachers at the time of initial employment. Educational variables included the type of undergraduate educational institution attended and academic achievement as measured by the grade point average (GPA). Experiential variables included the number of years of teaching experience and whether the employee had extended work experience outside of teaching. Demographical variables included the setting of early educational experience and the extent of mobility from job to job.

3. The results of the study cannot be generalized beyond Duval County, Florida. Any findings as they relate to other school districts can only be suggestive.

## Significance of the Study

Recruiting and selecting the best qualified teacher candidate for service in each school involves predicting the performance capabilities of people and comparing them with job requirements. These are perplexingly difficult responsibilities for personnel administrators and principals. Of particular concern is the identification, during the employment process, of those persons who will be LTS teachers. Identification after employment results in a disruption of the educational process and a loss of educational opportunity for students. Once a LTS teacher is employed and in a classroom, a number of factors hinder a quick resolution of the problem, and in all probability, the teacher will be in place for at least one school term. Resolution of the problem and/or dismissal of the teacher present an administrative burden, and in most instances, a financial burden to the educational unit.

Concern for the quality of education has surfaced often, and frequently the focus has been on the teacher. Policymakers and the general public worry over who enters teaching, how well qualified are the teachers, whether teachers are committed to their work, whether there will be a teacher shortage, and what the future holds for the profession. In 1986, incompetent teachers in the classroom was of concern nationwide. Numerous reports outlining the status of public education in the United States (e.g., the United States Commission on Excellence in Education's (1983) A Nation at Risk, the Twentieth Century Fund's (1983) Making the Grade, the Education Commission of the States' Task Force for Economic Growth's (1983) Action for Excellence, and Mortimer J. Adler's (1982) The Paideia Proposal) decried the poor state of the teaching profession.

The concern resulted in a flurry of legislative activity at the state level to upgrade requirements for teacher certification. A 1983 report indicated that "by 1985, half of the 50 states will require new teachers to take a basic-skills test before they can operate in a classroom" (Solorzano, 1983, p. 40). Other proposals included a national teacher credential, the establishment of professional examination boards to increase teacher or lay participation in the process of regulating entry to teaching, and the requirement for an additional year of preparation prior to certification (Sykes, 1983). Former U. S. Secretary of Education, Terrell H. Bell (1983), stated his concerns as follows:

> We are all aware of the critical importance of high quality teaching to the attainment of excellence in learning. We all know that we are not attracting the desired large numbers of bright and talented students into the teaching profession. (p. 3)

Secretary Bell continued by outlining the steps he felt were needed to improve the profession. He recommended tougher college requirements, longer internships, and increased salaries for the outstanding.

Hathaway (1980) determined that the selection of competent teachers cannot depend on the standards set by many accredited schools of education. In fact, he noted that

> in most states, until recently, mere possession of a teaching diploma from such an accredited institution was a passport to state certification as a teacher. As a result, the competent, marginally competent, and incompetent products of the teacher preparation and certification systems have all shown up at the school district personnel office with similar diplomas, indistinguishable transcripts due to grade inflation, largely glowing and unhelpful recommendations, and a state certificate to teach. (pp. 213-214)

The responsibility for protecting students from incompetent teachers rests with the selection process of the school district.

The fact that teachers with questionable competency are in classrooms was reported by Reagan (1983). In the Houston Independent School District, 301 teaching applicants were tested using the Stanford Test of Academic Skills designed for the 11th grade. Scores in English ranged from a low of 14 correct to a high of 69 correct out of 69. Forty-two percent could not add whole numbers, 24% could not round whole numbers, 33% could not measure an angle, and 42% could not calculate the area of a triangle (p. 19). Sykes (1983) reported that the low academic abilities of teachers appeared to be a historical fact, with education majors always ranked low on measures of academic achievement and of ability or intelligence. "In sum, teaching never enjoyed a golden age when the best and the brightest entered the ranks" (p. 25).

According to Coventry and Burstine (1977), the initial appointment of people, their progress through the organization, even their discharge, all depend on the right personnel policies and selection techniques. Taking on new employees is an expensive business. The attempted retraining of LTS teachers and the dismissal of incompetent instructors adds considerably to the cost of administering a school district. The DCPSS provided a convincing example. There was a major expenditure of time and money for the procedures used in dealing with the LTS teacher: (a) Fees were paid to legal staffs to insure successful litigation and proper legal opinions during the dismissal process. (b) Master teachers were used to observe, demonstrate, and assist unsatisfactory teachers during retraining efforts. (c) Finally, payment of salaries to LTS teachers, who were removed from classrooms until dismissal procedures were completed, was a requirement of the Duval County Teacher Tenure Act. In 1985, the dismissal proceedings were averaging a year in duration. During the four years included in this study, the following expenses were incurred due solely to contract maintenance and the tenure rights of the LTS teacher ("Legal Services," 1985):

| | |
|---|---|
| 1. Legal fees | $180,000 |
| 2. Retraining activities | 215,000 |
| 3. LTS teachers' salaries | 275,000 |
| Total | $670,000 |

Readily apparent, therefore, was the need for more research in the area of teacher selection and the recognition of factors that were attributed to effective teaching. The apparent importance of the classroom teacher to the quality of student achievement necessitated that selection procedures be established that will identify those characteristics. This seemed especially important in a large urban school district such as Duval County, Florida, where the size and diversity of the student population required a large number of classroom teachers, usually recruited from all parts of the United States and some foreign countries.

Personnel recruiters and administrators have few objective criteria on which to base employment decisions. The lack, as well as the subjectivity, of information available on teacher candidates confounds the selection process. A further impediment to the employment procedure is the lack of time and adequate staff to evaluate applicants.

The study was initiated to determine if certain educational, experiential, and demographical variables can be utilized to discriminate MTS teachers from LTS teachers. If such variables could be shown to distinguish between the two groups, then research in the area of teacher effectiveness would be enhanced and the results would have application for school systems as an aid in identifying teachers who, at the time of recruitment and selection, have characteristics similar to those determined as desirable. The effective use of information readily available during the employment process would alleviate encumbrances laid on educational systems by LTS teachers.

## Definition of Terms

The following terms are defined as used in the study:

Academic achievement. The grade point average (GPA) earned for all courses completed during the last six quarters or four semesters of the bachelor degree. Courses completed in contiguous summer terms were also included.

Community type. (a) Small rural--a town or unincorporated area of less than 10,000 inhabitants. (b) City--an incorporated municipality with between 10,000 and 100,000 inhabitants (not contiguous with a large metropolitan area). (c) Large metropolitan--a large incorporated municipality and contiguous area with population greater than 100,000.

Degrees of college admissions competitiveness. (a) More competitive--a grouping of colleges that admitted students whose averages were no less than B- and who ranked in the top 50% of their graduating class. Median freshman test scores were 525 and above on the SAT and 23 and above on the ACT. Schools in the category accepted one-half or less of their applicants. (b) Competitive--a grouping of colleges that had median freshman test scores between 450 and 525 on the SAT and between 19 and 22 on the ACT. Some of these colleges required that students have high school averages of B- or better, although others stated a minimum of C+ or C. Generally, these colleges preferred students in the top 50% of the graduating class and accepted between 75% and 85% of their applicants. (c) Less competitive--a grouping of colleges with median freshman test scores below 450 on the SAT and below 19 on the ACT. These colleges admitted students with averages below C who rank in the top 65% of the graduating class. These colleges usually admitted 85% or more of their applicants.

Demographical variables. (a) The setting of the teacher's early educational experience, and (b) the extent of the teacher's mobility.

DCPSS. Duval County Public School System, Jacksonville, Florida.

Early education experience. The type of community (small rural, city, or large metropolitan) where a teacher's secondary education was completed.

Educational variables. (a) The type of undergraduate educational institution the teacher attended and (b) the level of the teacher's academic achievement.

Elementary teacher. A teacher whose assignment is classroom instruction in one of the following grades: kindergarten, 1, 2, 3, 4, 5, or 6.

Experiential variables. (a) The number of years of teaching experience and (b) whether the employee had extended work experience outside education.

Extended work experience outside education. Work experience (five years or more) gained after the baccalaureate degree in any occupation other than formal educational classroom instruction.

Extent of mobility. The number of times a teacher changed jobs or teaching positions by moving from one school to another (both intradistrict and interdistrict) prior to being identified as LTS or MTS for the study.

Less-than-satisfactory (LTS) teacher. A teacher who received an unsatisfactory annual evaluation or who was dismissed from the DCPSS for incompetency.

More-than-satisfactory (MTS) teacher. A teacher who was rated in the upper 50% of those nominated as "Teacher of the Year" for Duval County from their respective schools.

Personnel file of a teacher. The permanent records that are the property of the school district and are stored and arranged according to individual employees by name. The individual file of a teacher contained an application, college transcripts, teacher certificate, pay records, letters of recommendation, record of assignments, discipline records, attendance records, records of professional development, as well as personal background information.

Secondary teacher. A teacher whose assignment is classroom instruction in one of the following grades: 7, 8, 9, 10, 11, or 12.

Teaching experience. Full-time classroom instruction in any educational institution. Not included are years in administration, nonclassroom assignments (e.g., librarians and guidance counselors), and part-time substitute teaching.

Teacher of the year. A teacher who has been selected by administrators and peers as an outstanding example of the teaching profession.

Undergraduate educational institution. The type of educational institution (more competitive, competitive, or less competitive), according to the degree of the institution's admissions competitiveness, from which the teacher completed the last six quarters or four semesters of the bachelor degree.

## Organization of the Remaining Chapters

A review of research and related literature is presented in Chapter II. Methods, the design of the study, and procedures for the collection and analysis of the data are discussed in Chapter III. The data are presented and analyzed in Chapter IV. The conclusions, a discussion of the findings, and recommendations are discussed in Chapter V.

# CHAPTER II
# REVIEW OF RELATED LITERATURE

Since the purpose of the study involved the investigation of educational, experiential, and demographical differences among the members of the teaching profession, the review of related literature begins with an examination of the characteristics of those in the profession. Subsequent sections highlight the research and literature that relate to each of the variables listed for investigation--age and experience; sex; knowledge, intelligence, and GPA; type of educational institution; early educational experience; and mobility.

## Characteristics of Those in the Teaching Profession

Interest in the characteristics and concern about the competence of classroom teachers has been a topic of discussion for many years. According to Davis (1966), the 1635 town records of Boston indicate that citizens voted to establish a school and set up rules not only to govern its curriculum and to regulate tuition and teachers' salaries but also to determine the qualifications of its teachers (pp. 1-10).

Initially, the sole requirement for teaching in public schools was a knowledge of the subject matter and a desire to impart that subject matter to others. With the early democratic movement in the United States came mass education and one of education's most difficult problems, the task of providing a sufficient number of teachers. Often teachers were recruited and placed with little regard for their qualifications due to the great demand (Cubberly, 1920, p. 446). Willard Waller (1932/1965, p. 410) characterized what he took to be the prevailing stereotypes of teaching as an occupation composed of unmarriageable women and unmarketable men. Koerner's (1963) Miseducation of American Teachers was a scathing indictment of teacher education and contained strong criticism of the characteristics of teachers in American schools. "By about any academic standard that can be applied, students in teacher training programs are among the least able on the campus" (p. 39).

Schlechty and Vance (1983) reported that the expansion of the teaching corps due to the postwar baby boom was a dramatic development and affected the elementary school population during the 1950-1960 period. However, due to a dramatic decline in the high school dropout rate between 1950 and 1960 the secondary school staffs expanded at a proportionately higher rate than the elementary schools. As a consequence, secondary school teachers were generally younger and less experienced than elementary school teachers during the 1950s and 1960s. Sex distribution was also affected during that period. From 1950 to 1970 the percentage of male teachers in the secondary school rose from 40% to over 50%. "Thus, the character of the secondary teaching corps was largely determined by an influx of young men who attended college as a result of the G. I. Bill and who attended colleges willing to accept an expanding population" (p. 472).

Schlechty and Vance continued by pointing out that the teaching corps could only be appreciated when one noted that most of the aging of the teaching force was reflected in secondary schools and resulted from the aging of those once young men hired during the 1950s and 1960s. "It is clear that the qualities and characteristics of older teachers, particularly older males, will have a dominant impact on the character of secondary school faculties" (p. 472). In 1979, the median years of experience for secondary teachers was 11, while for elementary teachers it was 10. Frankel and Gerald (1980) predicted that the size of the secondary teaching corps would decline by approximately 10% during the 1980s, while elementary school faculties would expand. Thus by 1990, the age differential between elementary and secondary school teachers would likely be greater than ever before.

In a survey of the career plans of female high school seniors in 1957 and their actual occupational choices by 1964, Pavalko (1970) found that 11% of the women recruited into teaching had IQ scores in the lower third while 56.8% had IQ scores in the upper third. By 1964, 73% of the lowest ability group remained in the teaching profession, 56.7% of the middle ability remained, and 59.3% of the highest ability level remained. Pavalko concluded: "Although teachers are recruited disproportionately from girls of higher measured intelligence, it is those of lower measured intelligence who continue working" (p. 352).

Henry Levin (1970) undertook a study to determine whether it was more cost effective to raise students' achievement scores by employing teachers with more years of experience or higher verbal ability. He found that the teachers with the highest verbal abilities were those with the least amount of experience. Furthermore,

> many of the most highly endowed of these individuals leave the schools within three years so that the stock of teachers with three years or more experience shows significantly lower test scores than those with less than three years experience. (p. 33)

During an examination of the career plans of college freshmen and their occupational choices after graduation from college, Sharp and Hirshfield (1975) found that those individuals who had planned a career in education and actually took jobs in education after graduation were most likely to have scored low on academic index that adjusted grade point average according to college selectivity. Sharp and Hirshfield made the following comments concerning the implications of their study:

> Defection, on the other hand, seemed to occur mainly among those students from lower socio-economic backgrounds whose professional aspiration level had been raised in college, perhaps because the institutions they attended--more frequently private and/or of high quality--tended to encourage them in the substitution of other careers for teaching,

> or perhaps because they themselves (for example, black men, women of high achievement with doctoral ambitions) perceived alternative career possibilities they had not initially recognized. Policy-makers who are primarily concerned with recruiting the "best and the brightest" into school systems will view these findings with alarm; those who are primarily eager to recruit sympathetic and service-oriented teachers will be pleased. (pp. 19-20)

During the late 1970s and early 1980s an abundance of literature critical of the state of United States education brought to the public's attention the issue of teacher quality. Writing on the effects of a decline in undergraduate enrollments, Weaver (1979) presented data that raised crucial questions about the ability of educational leaders to recruit and select students of high academic quality for the teaching profession. Comparing 1976 college-bound high school seniors who intended to major in education with all other college-bound seniors, he found those intending to pursue education to be 34 points below the mean SAT-verbal scores and 43 points below the mean on SAT-math scores. Weaver concluded that the overall quality of those recruited to teaching in the 1970s was probably lower than it was in the 1960s. Watkins (1981) pointed out similar data in College Board's 1980 report of Scholastic Aptitude Test scores for college-bound high school seniors. Six percent of students who said they planned to study education had some of the lowest scores on the test. Potential education majors had an average verbal score of 389 and an average math score of 418, compared with the national average of 424 on the verbal section, and 466 on the math section for all students. Schlechty and Vance (1983) also found a consistent decline in the measured academic ability of teachers entering teaching in North Carolina during the period 1973-1980.

In a 1982 study by Vance and Schlechty (cited by Schlechty & Vance, 1983), a decline in the number of high-ability white females entering teaching was found. Their investigation, based on a national sample, indicated that white males entering teaching were overrepresented in the top 20% of the Scholastic Aptitude Test (SAT) scores. Since, historically, there were more females than males in the high-ability groups entering teaching, the data supported the assertion that high-ability females disproportionately choose not to become teachers. Schlechty and Vance (1983) concluded that the same pattern was developing among blacks. For example, their data indicated that "among black college graduates who scored in the bottom 20% in verbal ability on the SAT, 27% entered teaching. In contrast, only 14.5% of the black college graduates in the remaining 80% entered teaching" (p. 475).

Schlechty and Vance concluded:

> The problem, of course, is that little institutional selection is involved in determining who will be teachers. Rather, it is a process of self-selection, and those who are most likely to select themselves as teachers are drawn from the least academically able college populations. . . .

> However, teaching does attract many who are academically quite proficient. . . . We found that 28% of teachers were above the median for all college graduates on the SAT. Unfortunately, we also found that public schools were no more likely to employ those who scored above the median than below, even when those scoring above the median sought teaching positions.
>
> Some studies indicate that the upper quarter of an entering cohort in terms of measured academic ability are twice as likely to leave as those in the lower quarter. . . . Thus, whatever selectivity follows entry into teaching tends to favor the academically less able. (pp. 483-484)

## Age and Experience as Factors of Teacher Effectiveness

The stated purpose of a study conducted by May and Doerge (1972) was to identify the informational and procedural items which, in the opinion of personnel administration experts and Louisiana public school personnel directors, were useful in the selection of teachers for the public school system. The authors contended that "good instruction depends upon competent teachers and the selection of competent teachers depends upon the information and procedures used by the school system in the securing and maintaining of good teachers" (p. 6). After completing a survey of all the personnel administrators in the study, a long list of informational items was produced. Each item was rated according to its importance and usefulness in the hiring process. Age was among those rated as an important item.

According to Getzels and Jackson (1963), the "Teacher Characteristics Study" directed by David Ryans in the late

1950s was "the single most extensive study of teachers to date" (p. 566). In that study Ryans (1960) drew the following conclusion concerning the age of teachers: "There appears to be little doubt about the existence of significant differences between teachers comprising different age groups with respect to a number of teacher characteristics" (p. 390). The older group of teachers (55 years and above) tended to be more systematic and businesslike in their classroom behavior and traditional in their educational viewpoints than those teachers under 55 years of age. On the other hand, the younger teachers scored higher on warmth, stimulating behavior, favorable opinions of pupils and administrators, verbal understanding, and emotional stability. Ryans (1960) indicated that the question arose

> as to whether these differences are dependent primarily on changes in the teacher's characteristics as he or she grows older and becomes more experienced, or on cultural influences, particularly those associated with emphasis impressed on teachers during their training. (p. 390)

Brodinsky (1979) described a respected, revered educator, who reached mandatory retirement, and the ensuing dispute over the regulations that forced her to resign. Brodinsky concluded that teachers may become seasoned, but they also can remain vigorous, creative, and innovative. The exceptional teacher remained active in the educational process and continually became more effective as the years passed by.

In a study conducted by Doty (1970), an attempt was made to establish criteria for the prediction of teaching success of women students who begin their teaching careers after the age of 35 relative to younger female teachers. She found that principals apparently rated younger teachers more consistently than they did older ones and viewed as effective teachers those women whose behavior was composed and orderly. Mature women in the study were viewed as highly effective by their employing principals. However, the data did not provide adequate predictor measures of teacher effectiveness among older teachers, perhaps due to the fact that mature women performed well on all the measures investigated.

Husen, Saha, and Noonan (1978) compiled a review of 32 studies of teacher training and student achievement in less developed countries and concluded:

> With respect to teacher demographic and background characteristics, . . . the evidence is somewhat ambiguous. What is certain, however, is that there are differences between young and old, males and females, with respect to teacher effectiveness. Naturally the effects of these two variables are contingent upon specific contexts. However, at least in some countries, it seems that males are more successful for early grades, and the older teachers seem more successful in the secondary grades. (p. 42).

In a paper presented to the annual meeting of the National Council for the Social Studies, Weslander and Arnsdorf (1982) stated that one objective of their study was to provide a clearer picture of who would be considered a quality social studies teacher. One hundred four social studies teachers in Delaware, Pennsylvania, and Maryland were surveyed and evaluated. Among other characteristics, an outstanding social studies teacher was found to be experienced, but young.

Perkes (1967) investigated the relationship between science teacher characteristics and student achievement. He found higher application scores and lower factual knowledge scores were gained by students taught by younger teachers with higher science grade point averages and more science methods credits. Teachers whose students scored higher on factual information had reversed characteristics. They were older, held fewer science and methods credits, and had completed their college work earlier.

Williamson (1969) attempted to determine whether biographical factors might be identified which would distinguish between teachers receiving high and low student assessments. Three thousand Colorado high school students were asked to identify the most effective and the least effective teacher out of all those they had encountered throughout their school experience. Those teachers who were identified by three or more students as most or least effective were asked to complete a biographical questionnaire. Significant correlations were found for 5 of the 20 items and the teacher rating. Age was not one of the items found to correlate significantly.

As might be expected, trends with regard to the extent of teaching experience were not substantially different from those with regard to age. Weber (1954), Brooks (1967), and May and Doerge (1972) asserted, among other factors, the amount of teaching experience was an important factor to consider when selecting and evaluating teachers. Similarly, Murnane (1975) reported significant relations between teaching experience and learner achievement. In a study to determine the relationship of a teacher's characteristics and experience to a learner's cognitive attainment of law-related content, Denton, Kracht, and McNamara (1977) concluded: "In other words, differences among teachers regarding content knowledge, instructional skills, and teaching experience do, in fact, result in cognitive attainment differences among classes of learners" (p. 11).

## Sex as a Factor of Teacher Effectiveness

In the study mentioned earlier of teacher characteristics by Ryans (1960), it was found that at the elementary school level, women and men differed in four of the personal-social characteristics studied: men were less responsible and businesslike in classroom behavior; more prone toward democratic classroom practices; more inclined toward permissive, child-centered educational viewpoints; and more emotionally stable than women. At the secondary school level, differences between the sexes were general and pronounced with women attaining significantly higher scores on the scales measuring friendliness, responsible behavior, stimulating classroom behavior, favorable attitude toward pupils, democratic classroom practices, permissive educational viewpoints, and verbal understanding. Men teachers in the secondary schools, however, scored significantly higher in emotional stability.

The results of an investigation by Howard Moskowitz (1980) suggested that differences occurred among the children in mathematics and reading achievement as a result of being in a male or female teacher's primary grade classroom. All students in the study, boys and girls, who were taught by male teachers demonstrated more important differences in the amount of reading gain than students in female teacher comparison groups. The male teachers were able to provide something different for both boys and girls in their classes. There were no important differences between any of the comparison groups of either male or female teacher classes in mathematics. This study supported the idea that more male teachers should be teaching primary grade children.

Tanner and Ebers (1985) conducted a three-year student of beginning teachers in Georgia, in which they found that female teachers tended to have higher success rates on a teacher performance assessment instrument (TPAI) than male teachers. The TPAI focused on competence in planning, choosing appropriate materials, evaluating objectives, organizing and presenting instructional activities, and classroom management. Sixty percent of the female teachers mastered the TPAI while only 38% of the male teachers were successful (p. 43).

In their reviews of other studies, Husen et al. (1978) found that generally male teachers seemed to be more successful with science achievement, while females appeared more successful with subjects like English and French. Furthermore, males seemed to be more successful in early grades, at least in some countries. In contrast, Williamson (1969) found no significant correlation between the teacher's sex and teacher effectiveness in his study comparing biographical factors and teacher effectiveness.

### Knowledge of Subject Matter, Intelligence, and Grade Point Average as Factors of Teacher Effectiveness

The following quotations summarize the predominant opinions found in relation to knowledge of subject matter and teacher effectiveness:

"The most important factor of good vocational teaching is the instructor's knowledge of his or her subject area" (Zirbel, 1980, p. 18).

"Good teaching depends on knowledge of a discipline" (Stewart, 1982, p. 10).

"Students rated the professor's knowledge of his subject and educational facts higher than any other criterion" (Gurney, 1977, p. 774).

> A well-rounded education is necessary and desirable, but the need to be well-informed in a constantly expanding field is no less important. . . .The biology teacher at the secondary level must be a jack-of-all-trades,

> and have at his or her command a widely diverse body of information and the means of communicating it to students. (Mariner, 1978, p. 149)

On the other hand, Guthrie (1982) offered a contrasting conclusion:

> Many factors that seem at first blush to affect teaching do not consistently predict teacher effectiveness. Teacher characteristics such as subject matter knowledge [and] intelligence. . . fail to produce startling results. Although sometimes significant, they do not generalize across primary and intermediate grades, low and high socioeconomic status pupils, reading and arithmetic. (p. 636)

Skipper (1975) conjectured that "it seems reasonable that effectiveness in teaching should be related to intelligence, academic achievement, and positive attitudes toward children and adolescents" (p. 38). In general, however, findings on the value of intelligence and grades as predictors of teaching effectiveness were mixed, with some authors very encouraged by positive correlations while others obtained indecisive results. In his attempt to decide if academic ability was important to effective training, Sykes (1983) stated, "academically able teachers who are verbally fluent are preferable to those of lesser ability but no hard evidence supports a relationship between teacher academic achievement or ability and student outcomes" (p. 26).

The abilities of teachers was also a concern of Weaver (1983) when he noted that "because of the absence of national test score data before 1970," one could not make a "large-scale, systematic assessment of entry teachers' academic abilities" (p. 4). However, he continued by asserting that "the data since 1970 do allow the question of entry teachers' academic ability to be answered, and the answer will please very few" (p. 4).

In two 1960s studies, course grades and GPA showed low correlations with principal and supervisor ratings (Eissey, 1967; Walberg, 1967). Other studies of the relationship between GPA and teaching performance, as measured by supervisor ratings, pupil evaluations, and student achievement gains, showed no significant correlations (Hensen, 1980; Stevens, 1979). The reasons why test scores and undergraduate GPA were such poor predictors of a teacher's on-the-job evaluation were discussed in a review of studies of the predictive validity of the National Teacher Examination by Quick, Witten, and Weinberg (1973). They concluded that on-the-job ratings were notoriously unreliable and that their reputation was well deserved. A possible reason offered was the lack of training of the raters as systematic observers.

Contrary to arguments presented elsewhere, in their study of under-developed countries, Husen et al. (1978) found that trained teachers, with higher levels of ability and knowledge, appeared more successful than those not so well endowed. They qualified their statements by suggesting that credentials were more important for those subject areas which required special skills and knowledge, and which were more dependent on the school for learning, such as mathematics and science.

A positive relationship was found between academic achievement and principals' ratings in Doty's (1970) study of women who begin teaching after the age of 35. Ryans (1960, p. 394) concluded that teachers who reported themselves as having been outstanding students were judged higher than other teachers as being more friendly, responsible, stimulating in classroom practice, having more favorable attitudes toward students, and democratic classroom practices. "The mean scores decreased in a fairly orderly fashion as the 'good' student, 'average' student, and 'poor' student groups were considered" (p. 394).

Skipper (1975) was very encouraged with the positive relationships he found between academic achievement and instructional competencies for secondary teachers. He concluded that secondary education students with higher grade point averages tend to be more effective teachers as judged by cooperating teachers and university supervisors. "In practical terms these findings mean that higher grade point averages can be used as a basis for selecting secondary student teaching candidates" (p. 39).

## Type of Higher Educational Institution as a Factor of Teacher Effectiveness

Kearney and Rocchio (1955) examined the relationship of the Minnesota Teacher Attitude Inventory (MTAI) scores to the type of educational institution attended by elementary teachers. The MTAI was designed to measure those attitudes which would predict how well a teacher would get along with pupils in interpersonal relationships, and indirectly how well satisfied the teacher would be with teaching as a vocation. Kearney and Rocchio found significant differences in the MTAI scores for the teachers graduating from one of the following types of institutions: (a) liberal arts college, (b) teachers college, and (c) university. Those teachers graduating from liberal arts colleges had the lowest scores, and graduates of the universities scored highest. The investigators concluded:

> It seems reasonable to expect that a teacher who is educated in an institution endorsing the viewpoint that a thorough background in liberal arts is essential for effective teaching will differ from one educated in an institution which emphasizes that knowledge alone does not guarantee that the teacher will manifest a desirable pattern of behavior in the classroom. (p. 704)

In a similar study by Cook, Kearney, Rocchio, and Thompson (1956) of the institutions from which secondary teachers graduated, it was found that those graduates of teacher colleges scored lowest and graduates of universities scored highest.

In Ryans' (1960) extensive study of teacher characteristics very few significant differences were found with respect to the type of college attended. The only two worthy of note were that teachers from large universities attained higher scores on stimulating classroom behavior and child-centered educational viewpoints than the graduates from other types of schools (p. 306). However, Tanner and Ebers (1985) found that beginning teachers who graduated from predominately white institutions performed better as measured on a teacher performance instrument (p. 43).

Studies conducted during the 1980s have indicated that teacher education has been criticized perhaps most consistently and severely because of low admission requirements of colleges and universities (American Association of Colleges for Teacher Education, 1985).

> The most frequently cited index of teacher quality is the college admission test scores of high school seniors who say they plan to become teachers; their scores are lower. . .than the scores of their peers planning to pursue other fields of study. (p. 13)

## Early Education and Personal Background as Factors of Teacher Effectiveness

In his study of the teacher labor market in the southeastern United States, Berry (1984) found that

> generally, both university education students and school system teachers come from lower-middle- and middle-class backgrounds. For many, especially those from rural areas, teaching is an occupation which represents a "step-up" from their parents. (p. 68)

> Generally, both university education student and school system teachers became interested in education because of previous positive experience in their own schooling, role models (teacher and family), and "their burning desire to work with children." For many, teaching provides similar rewards to those found in religion and church. (pp. 68-69)

Teachers who said they entered the profession because of its intellectual nature, because they had always liked school, and because of its social service character, generally scored higher on most of the teacher characteristics in the study by Ryans (1960, p. 394). Ryans suggested in his conclusion that participation in school-like activities (e.g., play school, reading to other children) during childhood and adolescence offered significant clues to the characteristics of teachers (p. 395). Similar conclusions were offered by Williamson (1969). His findings indicated that effective teachers were differentiated from ineffective teachers in five ways, two of which were that (a) effective teachers read more books for pleasure than did ineffective teachers and (b) the mothers of effective teachers had more formal education than did mothers of ineffective teachers.

The family background of effective teachers was deemed to be an important factor in several reported studies. First, in their examination of the educational and biographical backgrounds of nine university professors who had won a coveted teaching effectiveness award, Kelly and Kelly (1982) listed common background elements of non-affluent families, strong academic preparation, and motivation to seek a teaching career through the inspiration of a teacher. Second, Hanushek (1970), in a paper presented to a national personnel conference, concluded that specific socioeconomic class experiences are the best measures of teacher quality. Third, Moriarty (1981) claimed the environment in which successful teachers were reared was considered more important than special preparation programs. Finally, Husen et al. (1978)

found that teachers from upper status backgrounds were generally more effective than those from lower status origins in less developed countries.

## Mobility as a Factor of Teacher Effectiveness

Bloland and Selby (1980) reviewed research on teacher mobility from 1975 and 1980 and presented the following as a portion of their summary:

> Demographic Factors. Male teachers are more likely to change than females, with single males the most mobile. Single women are less mobile than men but more likely to leave teaching than married women. There is no apparent relationship between educational attainment and teacher mobility. Black teachers were found to be more stable and less mobile than white teachers. The higher the socioeconomic status of the teacher while in college and of the teacher's parents, the more likely the teacher was to leave the field. (p. 17)
>
> School-Related Factors. . . . An important factor in teacher career change is dissatisfaction with the principal which may stem in part from the principal's role, often unintentional, in reducing or eliminating teacher opportunity for creativity in the classroom. (p. 22)

Williamson (1969) summarized the research concerning the mobility of teachers: "Effective teachers changed their residence less often than did ineffective teachers, . . .[and] effective teachers tended to own their homes more than ineffective teachers" (p. 86). Williamson concluded that the apparent mobility of ineffective teachers as indicated by his findings was not surprising. The ineffective teacher tended to move more often than the effective teacher due to at least two factors: (a) unsatisfactory performance lead to dismissal and (b) poor teacher-pupil relationship created unpleasant and intolerable conditions, causing the teacher to leave.

## Generalizations from the Literature

A teacher in the United States was most likely to be female (men outnumbered women at the secondary level), have approximately 10 years experience, and be below average academically when compared to other college graduates. There was a distinct average age differential between elementary and secondary teachers, with secondary teachers being older. The age differential was predicted to increase due to population fluctuations. The literature, published after 1960, all indicated a downward trend in the academic ability of persons entering education. Of particular note were the findings that high-ability females and blacks were avoiding the educational field and that high-ability students who entered the teaching profession tended to leave after a few years.

The role of biographical and demographical information in the evaluative process was inconclusive. The literature yielded few definitive results for utilizing such information. The studies revealed that there were significant differences in the areas of effectiveness between older and younger teachers. A number of studies provided evidence that men and women also had varying degrees of effectiveness related to the level or subject taught.

The information regarding academic ability was also inconclusive. The view that individuals with higher academic ability were more effective teachers appeared to be widely accepted. In fact, little data supported this view. The only significant differences were for teachers in subject areas requiring specialized skills. Research, however, did support significant differences in teacher personality characteristics corresponding to the type of institution where training was received. An individual's effectiveness as a teacher was related to elements of personal background; however, research in this area was very poorly defined. As to be expected, ineffective teachers appeared to change teaching positions more often than others.

Despite the importance of the problem and the many published reports and studies on the subject, researchers did not arrive at a consensus concerning the characteristics of the effective teacher--especially with reference to educational, experiential, and demographical characteristics. "Recent research has provided pieces toward an answer, pieces whose advocates hope will be fitted together into a larger mosaic of the characteristics of a good teacher" (Ryan & Phillips, 1982, p. 1875).

# CHAPTER III
# METHODS AND PROCEDURES

The purpose of this study was to distinguish between less-than-satisfactory (LTS) and more-than-satisfactory (MTS) teachers using educational, experiential, and demographical information that would be readily available at the time of employment. This chapter describes the method of selection of teacher participants, the data collection and coding, and the study design and data analysis.

## Selection of Teacher Participants

The participants for the study were identified from classroom teachers employed by the Duval County Public School System (DCPSS), Jacksonville, Florida, during the four school terms 1981-82, 1982-83, 1983-84, and 1984-85. From personnel records, a list of all teachers who received an unsatisfactory final annual evaluation during any one of the four school years formed one group for study. The teachers so identified were referred to as the LTS Group. A teacher who received an unsatisfactory evaluation more than one time during the four year period was listed only once. One hundred fifty-seven teachers were identified as members of the LTS group.

Annually, each of the 145 schools in the county were encouraged to place into competition a nominee for the DCPSS

"Teacher of the Year." A committee of experienced teacher evaluators narrowed the number of candidates to approximately 50% of those nominated. A random sampling of the teachers in the reduced list formed the second group for study. The teachers so identified were referred to as the MTS group. A teacher nominated more than one time during the four year period was listed only once. One hundred sixty-six teachers were identified as members of the MTS group.

## Data Collection and Coding

The personnel records section of the DCPSS contained hard copies of the files of all employees under contract and microfilm copies of the files of former employees. The file of each of the teachers identified for this study was examined and a personal background data sheet was completed from the information found in the file. The data collected included the teacher's name, group membership (MTS or LTS), sex, race, teaching level (secondary or elementary), GPA, teaching experience, other work experience, mobility, early educational experience, and type of undergraduate educational institution the teacher attended. Data from the background sheets were coded and transferred to data collection forms to facilitate entry into computer storage. The computer facilities of the DCPSS and the Statistical

Package for the Social Sciences (SPSS), subprogram DISCRIMINANT were used to store and analyze the data.

A discussion of the discriminating variables used in the analysis and the method of coding the data follows:

1. Academic achievement as measured by GPA. Some of the teachers chosen for the study transferred into four-year colleges from junior colleges. There was also considerable transferring among colleges; therefore, the GPA for the last six quarters or four semesters of the bachelor's program was used as the measure of academic achievement. Only three of the teachers included in the study did not complete the last two years at the same institution. Since students began specializing in their majors during the last two years of their bachelor's program, it was felt that the GPA for that period most accurately measured academic achievement. The GPA was coded as a continuous variable with a value of 4.00 assigned for the grade of A, 3.00 for a B, 2.00 for a C, and 1.00 for a D.

2. Extended experience other than teaching. Five years or more in occupational experiences other than teaching was used to indicate extended experience. If a teacher had worked in an occupation outside of teaching for five or more years, the variable was assigned a value of 01. If the teacher had worked in another occupation less than five years, or none at all, the variable was assigned a value of 02.

3. Extent of mobility. This variable was included because the review of literature indicated a possible relationship between the amount of mobility and the perceived effectiveness of the teacher. The number of times the teacher changed jobs since receiving the bachelor's degree was coded on a continuous scale of 0-99. The total included changes from one school system to another as well as from one school to another in the same system. Changes from one job to another in occupations outside of education were also included.

4. Early educational experience. Does the size and type of community from which a teacher completed his/her high school education have an effect on teacher performance? To investigate the question, communities were categorized and coded as follows: (a) small rural communities of less than 10,000 inhabitants were assigned the value of 01, (b) towns or cities with a population between 10,000 and 100,000 and not contiguous to a large metropolitan area were assigned the value of 02, and (c) 03 was assigned to large metropolitan areas and the surrounding suburbs with a population greater than 100,000.

5. Teaching experience. The number of years of full-time classroom teaching experience that were completed by the teacher at the time of identification for the study was recorded as a continuous variable with range of 0-99.

6. Undergraduate educational institution. Barron's Educational Series, Inc., published annually a comprehensive college directory and reference volume entitled Profiles of America Colleges. Among others, one index in the series grouped all colleges in the United States into one of seven categories according to their degree of admissions competitiveness. For this study, those seven categories were collapsed into three and coded as follows: (a) More competitive--colleges that admitted students whose high school averages were no less than B- and who ranked in the top 50% of their graduating class. Median test scores ranged from 525 to 800 on the SAT and above 22 on the ACT. These schools accepted between one-quarter and three-quarters of their applicants. Schools in this category were assigned the value 01. (b) Competitive--some colleges admitted students whose high school averages were no less than B- while others stated a minimum of C+ or C and who ranked in the top 65% of their graduating class. Median test scores were between 450 and 525 on the SAT and between 19 and 22 on the ACT. These colleges accepted between 75% and 85% of their applicants. A value of 02 was assigned to schools in this group. (c) Less competitive--included in this category were schools with median test scores below 450 on the SAT and below 19 on the ACT. Students with below C averages in high school were admitted who ranked in the top 65% of the graduating class.

Usually 85% or more of their applicants were admitted. These schools received a value of 03.

A listing of all variables used in this study and the corresponding coding assigned is summarized in Table 1.

## Data Analysis and Study Design

Since the primary focus of the study was to distinguish between the members of the LTS Group and the MTS Group, the statistical procedure, discriminant analysis, was employed to analyze data. The employment practices used by the DCPSS sought an optimal balance among black, white, male, female, elementary, and secondary employees; therefore, discriminant analysis was utilized to distinguish between members of these subsets as well as the total group of identified teachers. To distinguish between the LTS and MTS groups, the six discriminating variables listed in the preceding section were used to measure characteristics on which the groups were expected to differ. The same six variables were used with each of the seven subsets identified in the problem statement.

According to Klecka (1975), "the statistical theory of discriminant analysis assumes that the discriminating variables have a multivariate normal distribution and that they have equal variance-covariance matrices within each group" (p. 435). In practice, however, he claimed that the technique was very robust and strict adherence to the assumptions was not necessary. "The mathematical objective of

Table 1

Code Assignments for Discriminating and Group Membership Variables

| Variables | Code | Description |
|---|---|---|
| Group Membership | | |
| Competency Rating | 01<br>02 | MTS<br>LTS |
| Sex | 01<br>02 | Male<br>Female |
| Race | 01<br>02 | White<br>Black |
| Teaching Level | 01<br>02 | Elementary<br>Secondary |
| Discriminating | | |
| GPA | 0.00-4.00 | GPA for last two years of the bachelor's degree |
| Other Work Experience | 01 | Five years or more work experience other than teaching. |
| | 02 | Less than five years of other work experience. |
| Mobility | 01-99 | Number of times changed jobs. |
| Early Educational Experience | 01 | Population of home town less than 10,000 |
| | 02 | Population of home town between 10,000 and 100,000 |
| | 03 | Population of home town greater than 100,000 |
| Teaching Experience | 01-99 | Number of years of classroom teaching experience |
| College Type | 01<br>02<br>03 | More competitive<br>Competitive<br>Less competitive |

discriminant analysis is to weight and linearly combine the discriminating variables in some fashion so that the groups are forced to be as statistically distinct as possible" (p. 435). In order to do this a linear combination of the discriminating variables was produced of the form

$$D = d_1X_1 + d_2X_2 + \ldots + d_nX_n$$

where D was the score on the discriminant function, the d's were weighted coefficients, and the X's were the standardized values of the $n$ discriminating variables.

Since the discriminating variables were not coded in standard form, the standardized discriminant function coefficients were not very useful for computational purposes. Therefore, the option available with SPSS that prints the unstandardized coefficients was requested. These coefficients are multiplied by the raw values of the associated variables to arrive at a discriminant score. After adding a constant to adjust for the grand means, a score is obtained which is identical to the one computed with standardized coefficients and standardized data. The unstandardized coefficients do not, however, report the relative importance of the variables as do the standardized coefficients. Once the discriminant function was derived then two objectives were pursued: analysis and classification.

## Analysis

Tools for interpretating the data included statistical tests for measuring the success with which the discriminating variables actually discriminated when combined into the discriminant function. Most importantly, the weighted coefficients served to identify the variables which contributed most to differentiation.

## Classification

Once a set of variables was found that provided satisfactory discrimination for the two groups of teachers, classification functions were derived which could permit the classification of new teachers. This procedure involved the use of a separate linear combination for each group. The equation of one group appeared as

$$C_i = c_{i1} Y_{i1} + c_{i2} Y_{i2} + \ldots + c_{ij} Y_{ij} + c_i$$

where $C_i$ was the classification score for group *i*, the $c_{ij}$'s were the classification coefficients with $c_i$ being the constant, and the Y's were the raw scores on the discriminating variables. Under the assumption of a multivariate normal distribution, the classification scores can be converted into probabilities of group membership. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

In order to select the most useful of the discriminating variables, the stepwise procedure available in the subprogram was used. This process began by choosing the single variable that had the highest value on the selection criterion. The selection criterion for this study was the smallest value of Wilks' lambda (equivalent to the largest overall F ratio). This initial variable was then paired with each of the other variables, one at a time. The new variable, which in conjunction with the first variable produced the best results, was selected for the equation. This process was continued until no improvement was measured by adding variables.

As variables are selected for inclusion, some variables previously selected may lose their discriminating power. This occurs because the information that they contain about group differences is available in some combination of the other included variables. Such variables are eliminated. Thus, at the beginning of each step, each of the previously selected variables is tested to determine if it still makes a sufficient contribution to discrimination.

The selection criterion used in this study was the overall F ratio for the test of differences between the group centroids. The variable which maximizes the F ratio also minimizes Wilks' lambda, a measure of group discrimination. This test takes into consideration the differences between all the centroids and the cohesion within groups. The criterion for selection or removal of variables was set at 1.0 or greater for the value of the F ratio.

# CHAPTER IV
# ANALYSIS OF THE DATA

The purpose of this study was to distinguish between less-than-satisfactory teachers and more-than-satisfactory teachers based upon certain educational, experiential, and demographical variables that would be readily discernible at the time of initial employment. The following specific questions were addressed:

1. To what extent do the selected variables discriminate between LTS elementary teachers and MTS elementary teachers?

2. To what extent do the selected variables discriminate between LTS secondary teachers and MTS secondary teachers?

3. To what extent do the selected variables discriminate between LTS black teachers and MTS black teachers?

4. To what extent do the selected variables discriminate between LTS white teachers and MTS white teachers?

5. To what extent do the selected variables discriminate between LTS male teachers and MTS male teachers?

6. To what extent do the selected variables discriminate between LTS female teachers and MTS female teachers?

7. To what extent do the selected variables discriminate between all LTS teachers and all MTS teachers?

The discriminating variables used in the study were grade point average (GPA), teaching experience, experience other than teaching, mobility, early educational experience, and type of college attended. The variables used to indicate group membership were competency rating (MTS or LTS), sex (male or female), race (black or white), and teaching level (elementary or secondary).

The remainder of this chapter is organized into nine sections. The first section contains an analysis of the correlation matrix of all the variables used in the study. In each of the next seven sections is presented an analysis of the data pertinent to the questions posed in the problem statement. The chapter concludes with a summary and comparison of the data reported in each of the previously reported sections.

## Correlation of Variables

The Statistical Package for the Social Sciences (SPSS), subprogram DISCRIMINANT, was used to measure how well the selected variables discriminated between the MTS and LTS groups. As part of the analysis, a correlation matrix was calculated depicting the relationships among all variables (both group membership and discriminating variables) and is shown as Table 2. The purpose of Table 2 is to provide the reader with some understanding of the extent to which pairs of variables correlated.

Table 2

Correlation Matrix for All Variables

| | Competency Rating | Sex | Race | Teaching Level | Teaching Experience | Mobility | Other Experience | Early Ed. Experience | University Type | G P A |
|---|---|---|---|---|---|---|---|---|---|---|
| Competency Rating | 1.000 | | | | | | | | | |
| Sex | -0.156* | 1.000 | | | | | | | | |
| Race | 0.208* | 0.103 | 1.000 | | | | | | | |
| Teaching Level | 0.183* | -0.320* | -0.107 | 1.000 | | | | | | |
| Teaching Experience | 0.020 | 0.104 | 0.128* | 0.019 | 1.000 | | | | | |
| Mobility | 0.328* | 0.038 | 0.025 | 0.085 | 0.478* | 1.000 | | | | |
| Other Experience | -0.231* | 0.384* | 0.138* | -0.219* | -0.148* | -0.233* | 1.000 | | | |
| Early Educational Experience | 0.005 | -0.031 | 0.267* | -0.010 | -0.105 | -0.127* | 0.076 | 1.000 | | |
| University Type | 0.124* | 0.054 | 0.553* | -0.128* | -0.054 | -0.041 | -0.008 | 0.030 | 1.000 | |
| G P A | -0.352* | 0.001 | -0.174* | -0.149* | -0.156* | -0.231 | -0.055 | 0.004 | 0.007 | 1.000 |

*Significant at or beyond the .05 level

Moderately strong correlations ($p < .05$) were found between competency rating and both mobility (0.328) and GPA (-0.352). This indicates that the LTS group was more mobile and had lower grade point averages than those in the MTS group. The negative correlation (-0.320) between sex and teaching level indicates that the elementary teachers in the study were predominantly female, and the positive correlation (0.384) between sex and other experience implies males were more inclined to have had five or more years of work experience outside of education than females.

The strongest correlations reported in Table 2 are between mobility and teaching experience (0.478) and between race and university type (0.553). For the group of teachers studied, the average black teacher attended a less competitive college than the average white teacher, and the more experienced teacher changed jobs most often.

Other significant ($p < .05$) but modest correlation coefficients indicate that the average black teacher identified for this study was more likely than the average white teacher to have graduated from high school in a large metropolitan area (0.267) and be identified as LTS (0.207). Also, those teachers who had worked five years or more in jobs other than education tended to be LTS (-0.231), teach at the secondary level (-0.219), and change jobs more often (-0.233) than those teachers who did not have the other experience. Those teachers who changed jobs most often tended to have lower grade point averages (-0.231).

## Data Analysis Relative to Elementary Teachers

Of the 323 teachers selected for the study, 162 were teaching at the elementary school level. Sixty-four of the 162 elementary teachers were in the LTS group while 98 were considered MTS. The average elementary teacher had 13.5 years of teaching experience, changed jobs four times, not worked outside of education for five years or more, graduated from high school in a city with a population between 10,000 and 100,000, attended a competitive college, and maintained a GPA of 2.90 for the last two years of the bachelor's degree.

A summary of the means and standard deviations of the six selected variables is shown in Table 3.

Table 3

Means and Standard Deviations of Selected Variables for Elementary Teachers with Competency Group Membership as Criterion

| Variable | MTS Group M | MTS Group SD | LTS Group M | LTS Group SD | Total M | Total SD |
|---|---|---|---|---|---|---|
| Teaching Experience | 12.959 | 8.707 | 14.313 | 9.979 | 13.494 | 9.224 |
| Mobility | 3.439 | 2.470 | 4.844 | 2.521 | 3.994 | 2.577 |
| Other Experience | 1.878 | 0.329 | 1.906 | 0.294 | 1.889 | 0.315 |
| Early Ed. Experience | 2.286 | 0.825 | 2.266 | 0.877 | 2.278 | 0.843 |
| College Type | 2.388 | 0.741 | 2.469 | 0.816 | 2.420 | 0.720 |
| GPA | 3.054 | 0.437 | 2.655 | 0.392 | 2.896 | 0.462 |

A review of the data indicates that the average LTS elementary teacher had 1.4 more years of teaching experience, changed jobs 1.4 more times, and had a 0.39 lower GPA than the average MTS elementary teacher. Neither the average MTS nor LTS elementary teacher had five years or more work experience other than in education and both grew up in a mid-sized city. The mean scores for the college type were more skewed toward less competitive for the LTS group than for the MTS group.

Stepwise DISCRIMINANT analysis was used to identify variables that discriminated between the LTS and MTS groups. Before any variables were placed into the analysis a Wilks' lambda and corresponding F ratio were calculated for each of the discriminating variables. The process began by choosing the single variable (GPA) which had the smallest Wilks' lambda (0.821). This variable was then paired with each of the other variables, one at a time, and new Wilks' lambdas were computed. The new variable (mobility) which in conjunction with the initial variable (GPA) produced the smallest Wilks' lambda (0.791) was selected as the second variable. These two were then combined with each of the remaining variables, one at a time, to form triplets which were evaluated using Wilks' lambda. The triplet (GPA, mobility, and teaching experience) with the best criterion value (0.780) added teaching experience as the third variable in the analysis. The fourth variable selected was college type with Wilks' lambda of 0.774.

After the fourth variable was selected, the values of the F ratio for the remaining variables, other experience (0.413) and early educational experience (0.015), were too small to provide a minimum level of improvement. They were therefore not included in the remaining analysis.

Using the four selected variables, a significant discriminant function was obtained with a canonical correlation of 0.475, a Wilks' lambda of 0.774, and a chi-square of 40.438 with four degrees of freedom and significance of 0.0000. The nonstandardized equation

COMPETENCY RATING = 0.033(teaching experience) - 0.240(mobility) - 0.247(college type) + 1.97(GPA) - 4.596

correctly grouped 70.99% of the 162 elementary cases.

Table 4 contains the results of the discriminate analysis in terms of both the standardized and nonstandardized coefficients.

Table 4

Discriminant Analysis Coefficients for Elementary Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | 0.3016 | 0.0327 |
| Mobility | -0.5971 | -0.2397 |
| College Type | -0.1908 | -0.2474 |
| GPA | 0.8282 | 1.9720 |
| (Constant) | | -4.5963 |

As can be seen from the standardized coefficients, GPA contributes most to differentiation in the analysis, with mobility, teaching experience, and college type following in order of importance. Also, the standardized coefficients indicate that mobility contributes twice as much as teaching experience and GPA four times as much as college type.

An option available with the subprogram DISCRIMINANT was the derivation of classification functions. That option was utilized to produce the coefficients listed in Table 5.

Table 5

Classification Function Coefficients for LTS vs. MTS Elementary Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | 0.1360 | 0.1719 |
| Mobility | 1.1143 | 0.8511 |
| College Type | 4.6283 | 4.3566 |
| GPA | 16.1764 | 18.3414 |
| (Constant) | -31.5558 | -36.4756 |

The equations formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

## Data Analysis Relative to Secondary Teachers

One hundred sixty-one of the teachers identified in the study were teaching at the secondary school level. Sixty-eight of the 161 were in the MTS group while 93 were classified as LTS. The average secondary teacher had 13.8 years of teaching experience, changed jobs 4 1/2 times, not worked outside of education for five years or more, graduated from high school in a city with a population between 10,000 and 100,000, attended a competitive college, and maintained a GPA of 2.76 for the last two years of the bachelor's degree.

A review of the means and standard deviations of the six selected variables is shown in Table 6.

Table 6

Means and Standard Deviations of Selected Variables for Secondary Teachers with Competency Group Membership as Criterion

| Variable | MTS Group | | LTS Group | | Total | |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD |
| Teaching Experience | 14.265 | 6.910 | 13.527 | 9.928 | 13.839 | 8.763 |
| Mobility | 3.074 | 2.500 | 5.548 | 3.556 | 4.503 | 3.375 |
| Other Experience | 1.912 | 0.286 | 1.570 | 0.500 | 1.714 | 0.453 |
| Early Ed. Experience | 2.235 | 0.849 | 2.280 | 0.839 | 2.261 | 0.841 |
| College Type | 1.971 | 0.846 | 2.387 | 0.821 | 2.211 | 0.854 |
| GPA | 2.889 | 0.467 | 2.664 | 0.425 | 2.759 | 0.456 |

The data indicate that the average LTS secondary teacher had 0.7 less years of teaching experience, changed jobs 2.5 more often, and had a 0.22 lower GPA than the average MTS secondary teacher. The average LTS secondary teacher was more likely to have had other work experience than was the average MTS teacher, and both grew up in a mid-sized city. The MTS secondary teacher attended a competitive college while the mean score for the LTS teacher fell between competitive and less competitive.

The DISCRIMINANT analysis began by choosing the single variable (other experience) which contributed most to differentiation and which had the smallest Wilks' lambda (0.860). The variable (mobility) which in conjunction with the initial variable (other experience) produced the smallest Wilks' lambda (0.787) was selected as the second variable. These two were then combined with each of the remaining variables and the triplet (other experience, mobility, and college type) had the best criterion value (0.739). The remaining variables all had F ratio levels sufficient for inclusion in the analysis and were chosen in the following order: fourth, GPA with criterion value of 0.699; fifth, teaching experience with criterion value of 0.682; and sixth, early educational experience with criterion value of 0.675.

Using the six variables, a significant discriminant function was obtained with a canonical correlation of 0.570, a Wilks' lambda of 0.675, and a chi-square of 61.352 with six degrees of freedom and significance of 0.0000. The nonstandardized equation

COMPETENCY RATING = .032(teaching experience) - 0.189(mobility) + 1.337(other experience) - 0.220(early educational experience) - 0.522(college type) + 0.976(GPA) - 2.928

correctly grouped 78.88% of the 161 secondary cases.

Table 7 contains the results of the discriminate analysis in terms of both the standardized and nonstandardized coefficients.

Table 7

Discriminant Analysis Coefficients for Secondary Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | 0.2844 | 0.0324 |
| Mobility | -0.5976 | -0.1895 |
| Other Experience | 0.5636 | 1.3366 |
| Early Ed. Experience | -0.1854 | -0.2200 |
| College Type | -0.4341 | -0.5219 |
| GPA | 0.4325 | 0.9762 |
| (Constant) | | -2.9281 |

The values of the standardized coefficients indicate that the variables mobility and other experience contributed most to differentiation and were of near equal importance. College type and GPA likewise contributed equally but of less importance. The contributions of teaching experience and early education experience were small when compared to the other variables.

Classification function coefficients were derived using the six variables selected during the analysis process. The coefficients for each group are listed in Table 8.

Table 8

Classification Function Coefficients for LTS vs. MTS Secondary Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | 0.0922 | 0.1374 |
| Mobility | 1.1915 | 0.9269 |
| Other Experience | 11.3235 | 13.1901 |
| Early Ed. Experience | 3.3750 | 3.0678 |
| College Type | 3.1306 | 2.4018 |
| GPA | 16.5666 | 17.9299 |
| (Constant) | -43.1586 | -47.3993 |

The equation formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

## Data Analysis Relative to Black Teachers

Thirty-seven percent, or 119 of the 323 teachers reported in the study, were black. Of the black teachers, 45 were classified as MTS and 74 were in the LTS group. The average black teacher had 15 years of teaching experience, changed jobs four times, did not have extensive work experience outside of education, graduated from high school in a large metropolitan area or a mid-sized city with equal frequency, and finished the bachelor's degree with a 2.72 grade point average from a less competitive college.

The means and standard deviations, as shown in Table 9, indicate that the MTS black teacher had 0.7 years more teaching experience, changed jobs 1.8 less times, and had a 0.30 higher GPA than the average LTS black teacher. Both the MTS and LTS groups had early education experiences in predominately mid-sized and large cities and attended less competitive colleges. Neither group, as an average, had work experience outside of education.

During the analysis process, the variables selected with significant discriminating power and in order of selection were GPA, with Wilks' lambda of 0.869; mobility, with criterion value of 0.816; teaching experience with criterion value of 0.793; and college type, with Wilks' lambda of 0.780. The F ratio values for the two remaining variables, other experience and early educational experience, were insufficient to provide a minimum level of improvement and were therefore excluded from the remaining analysis.

Table 9

Means and Standard Deviations of Selected Variables for Black Teachers with Competency Group Membership as Criterion

| Variable | MTS Group | | LTS Group | | Total | |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD |
| Teaching Experience | 15.578 | 9.471 | 14.919 | 9.168 | 15.168 | 9.353 |
| Mobility | 3.244 | 2.541 | 5.014 | 3.000 | 4.345 | 2.924 |
| Other Experience | 1.933 | 0.252 | 1.838 | 0.371 | 1.874 | 0.333 |
| Early Ed. Experience | 2.578 | 0.753 | 2.554 | 0.743 | 2.563 | 0.744 |
| College Type | 2.844 | 0.475 | 2.946 | 0.281 | 0.908 | 0.368 |
| GPA | 2.908 | 0.373 | 2.609 | 0.379 | 2.722 | 0.402 |

Using the four selected variables, a significant discriminant function was derived with a canonical correlation of 0.469, a Wilks' lambda of 0.780, and a chi-square of 28.635 with four degrees of freedom and significance of 0.0000. The nonstandardized equation

COMPETENCY RATING = 0.050(teaching experience) - 0.248(mobility) - 0.770(college type) + 1.798(GPA) - 2.330

correctly grouped 73.95% of the 119 cases.

Table 10 contains the results of the discriminant analysis in terms of both the standardized and nonstandardized coefficients. As can be seen from the standardized coefficients, mobility and GPA contributed most to differentiation with near equal values. Teaching experience was next in order of importance and contributed nearly twice as much as college type.

Table 10

Discriminant Analysis Coefficient for Black Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | 0.4648 | 0.0495 |
| Mobility | -0.6957 | -0.2479 |
| College Type | -0.2820 | -0.7699 |
| GPA | 0.6770 | 1.7980 |
| (Constant) | | -2.3298 |

Classification functions were derived using the four variables selected during the analysis process. The coefficients for the derived functions for each group are listed in Table 11.

The equations formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

Table 11

Classification Function Coefficients for LTS vs. MTS Black Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | -0.1141 | -0.0603 |
| Mobility | 0.6717 | 0.4022 |
| College Type | 21.7647 | 20.9276 |
| GPA | 18.5808 | 20.5358 |
| (Constant) | -57.8237 | -60.5009 |

### Data Analysis Relative to White Teachers

Of the 323 teachers selected for the study, 204 were white. One hundred twenty-one of the 204 were in the MTS group and 83 were classified as LTS. The average white teacher had 12.8 years of teaching experience, changed jobs four times, not worked outside of education extensively, graduated from high school in a mid-sized city, attended a competitive college, and maintained a GPA of 2.89 for the last two years of the bachelor's degree.

The means and standard deviations of the selected variables, as shown in Table 12, indicate that the average LTS white teacher had approximately the same number of years of teaching experience, changed jobs two more times, and had a 0.31 lower GPA than the average MTS white teacher. The LTS white teacher was more likely to have had five or more years of work experience outside of education than the MTS white teacher. The average teacher in both groups graduated from high school in a city with population between 10,000 and 100,000 and attended a competitive college.

Table 12

Means and Standard Deviations of Selected Variables for White Teachers with Competency Group Membership as Criterion

| Variable | MTS Group M | MTS Group SD | LTS Group M | LTS Group SD | Total M | Total SD |
|---|---|---|---|---|---|---|
| Teaching Experience | 12.719 | 7.175 | 12.892 | 10.516 | 12.789 | 8.667 |
| Mobility | 3.306 | 2.503 | 5.482 | 3.344 | 4.191 | 3.061 |
| Other Experience | 1.876 | 0.331 | 1.590 | 0.495 | 1.760 | 0.428 |
| Early Ed. Experience | 2.149 | 0.833 | 2.024 | 0.869 | 2.098 | 0.848 |
| College Type | 1.983 | 0.785 | 1.952 | 0.854 | 1.971 | 0.812 |
| GPA | 3.015 | 0.481 | 2.706 | 0.434 | 2.889 | 0.486 |

The variable mobility, with the smallest criterion value (0.877), was selected first during the discriminate analysis. The other variables and order of selection were other experience, with criterion value of 0.805; GPA, with criterion value of 0.734; and teaching experience, with criterion value of 0.716. The two remaining variables, early educational experience and college type, had F ratios insufficient for inclusion in further analysis.

The four variables selected produced a significant discriminant function with a canonical correlation of 0.533, a Wilks' lambda of 0.716, and a chi-square of 66.822 with four degrees of freedom and significance of 0.0000. The nonstandardized equation

COMPETENCY RATING = 0.042(teaching experience) -
0.228(mobility) + 1.350(other experience) +
1.302(GPA) - 5.724

correctly grouped 74.51% of the 204 white teachers.

The standardized and nonstandardized coefficients produced by the analysis of white teachers are shown in Table 13. An examination of the standardized coefficients indicates that mobility contributed most to differentiation with GPA and other experience following closely in amount of contribution. Teaching experience had little more than one-half the differentiation power of mobility.

Table 13

Discriminant Analysis Coefficients for White Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | 0.3666 | 0.0422 |
| Mobility | -0.6540 | -0.2276 |
| Other Experience | 0.5472 | 1.3495 |
| GPA | 0.6022 | 1.3023 |
| (Constant) | | -5.7237 |

Classification functions were derived using the four variables selected during the analysis process. The coefficients for each competency group are listed in Table 14.

Table 14

Classification Function Coefficients for LTS vs. MTS White Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | 0.0315 | 0.0854 |
| Mobility | 1.1708 | 0.8805 |
| Other Experience | 13.6325 | 15.3542 |
| GPA | 16.1690 | 17.8305 |
| (Constant) | -36.8236 | -43.9744 |

The equations formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

## Data Analysis Relative to Male Teachers

Ninety of the teachers selected for the study were male. Of those 90, 35 were in the MTS group while 55 were LTS. The average male teacher had 12.2 years of teaching experience, changed jobs four times, as likely as not worked outside of education for an extended time, graduated from high school in a city with a population between 10,000 and 100,000, attended a competitive college, and maintained a GPA of 2.83 for the last two years of the bachelor's degree.

Table 15 depicts the means and standard deviations of the six selected variables. A review of the data indicates that the average MTS male teacher had 0.9 less years of teaching experience, changed jobs 2.2 less times, and had 0.16 higher GPA than the average LTS male teacher. There were near equal numbers of male teachers who have five years of other work experience and who did not, for both the LTS and MTS groups. Both groups grew up in a mid-sized city with the MTS male coming from the large city more often than the LTS male. While the average male in both groups graduated from a competitive college, the mean score for the LTS group was more skewed toward less competitive than was the score for the MTS group.

The DISCRIMINANT analysis began by choosing the single variable (mobility) which contributed most to differentiation and which had the smallest Wilks' lambda (0.861). The variable (teaching experience) which in conjunction with the initial variable (mobility) produced the smallest Wilks' lambda (0.844) was selected as the second variable. These two were then combined with each of the remaining variables and the triplet (mobility, teaching experience, and GPA) had the best criterion value (0.832). The fourth variable selected was college type with Wilks' lambda of 0.822.

Table 15

Means and Standard Deviations of Selected Variables for Male Teachers with Competency Group Membership as Criterion

| Variable | MTS Group | | LTS Group | | Total | |
|---|---|---|---|---|---|---|
| | M | SD | M | SD | M | SD |
| Teaching Experience | 11.600 | 5.972 | 12.527 | 9.424 | 12.167 | 8.229 |
| Mobility | 2.743 | 2.241 | 4.909 | 2.889 | 4.067 | 2.847 |
| Other Experience | 1.686 | 0.471 | 1.473 | 0.504 | 1.556 | 0.500 |
| Early Ed. Experience | 2.429 | 0.778 | 2.236 | 0.860 | 2.311 | 0.830 |
| College Type | 2.114 | 0.832 | 2.327 | 0.818 | 2.244 | 0.825 |
| GPA | 2.930 | 0.488 | 2.762 | 0.467 | 2.827 | 0.480 |

After the fourth variable was selected, the values of the F ratio for the remaining variables, other experience (0.410) and early educational experience (0.932), were too small to provide a minimum level of improvement. They were therefore not included in the remaining analysis.

Using the four variables, a significant discriminant function was obtained with a canonical correlation of 0.422, a Wilks' lambda of 0.822, and a chi-square of 16.850 with four degrees of freedom and significance of 0.0021. The nonstandardized equation

COMPETENCY RATING = -0.050(Teaching Experience) + 0.380 (Mobility) + 0.315(University Type) - 0.587(GPA) + .009

correctly grouped 61.8% of the 90 male cases.

Table 16 contains the results of the discriminate analysis in terms of both the standardized and nonstandardized coefficients.

Table 16

Discriminant Analysis Coefficients for Male Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | -0.4102 | -0.0496 |
| Mobility | 1.0109 | 0.3805 |
| College Type | 0.2590 | 0.3145 |
| GPA | -0.2788 | -0.5866 |
| (Constant) | | 0.0089 |

The values of the standardized coefficients indicate that the variable mobility contributed two and one-half times more to differentiation than did teaching experience. College type and GPA, with near equal contribution, were only one-fourth as important as mobility.

Classification function coefficients were derived using the four variables selected during the analysis process. The coefficients for each group are listed in Table 17.

The equations formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

Table 17

Classification Function Coefficients for LTS vs. MTS Male Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | 0.2398 | 0.2866 |
| Mobility | 0.7756 | 0.4166 |
| College Type | 3.6283 | 3.3314 |
| GPA | 13.9214 | 14.4749 |
| (Constant) | -27.5449 | -27.6523 |

## Data Analysis Relative to Female Teachers

Seventy-two percent, or 233 of the 323 teachers reported in the study, were female. Of the female teachers, 131 were classified as MTS and 102 were in the LTS group. The average female teacher had 14.2 years of teaching experience, changed jobs four times, did not have extensive work experience outside of education, graduated from high school in a mid-sized city, and finished the bachelor's degree with a 2.83 grade point average from a competitive college.

The means and standard deviations, as shown in Table 18, indicate that the MTS female teacher had 0.56 less years teaching experience, changed jobs two less times, and had a 0.40 higher GPA than the average LTS female teacher. Neither group, as an average, had work experience outside of education. Both the MTS and LTS groups had early educational experience in mid-sized cities, and both attended competitive colleges. The mean score for university type was, however, skewed more toward less competitive for the LTS group.

During the discriminant analysis process, all six of the variables had F ratio levels sufficient for inclusion and were therefore selected in the following order: GPA, with Wilks' lambda of 0.815; mobility, with criterion value of 0.762; college type, with Wilks' lambda of 0.734; teaching experience, with Wilks' lambda of 0.712; other experience, with criterion value of 0.705; and early educational experience, with criterion value of 0.699.

Table 18

Means and Standard Deviations of Selected Variables for Female Teachers with Competency Group Membership as Criterion

| Variable | MTS Group |  | LTS Group |  | Total |  |
|---|---|---|---|---|---|---|
|  | M | SD | M | SD | M | SD |
| Teaching Experience | 14.000 | 8.435 | 14.559 | 10.158 | 14.245 | 9.212 |
| Mobility | 3.435 | 2.530 | 5.451 | 3.332 | 4.318 | 3.070 |
| Other Experience | 1.947 | 0.226 | 1.833 | 0.375 | 1.897 | 0.305 |
| Early Ed. Experience | 2.221 | 0.844 | 2.294 | 0.851 | 2.253 | 0.846 |
| College Type | 2.244 | 0.805 | 2.471 | 0.817 | 2.343 | 0.816 |
| GPA | 3.001 | 0.447 | 2.606 | 0.367 | 2.828 | 0.458 |

Using the six variables, a significant discriminant function was derived with a canonical correlation of 0.549, a Wilks' lambda of 0.699, and a chi-square of 81.739 with six degrees of freedom and significance of 0.0000. The non-standardized equation

COMPETENCY RATING = 0.031(teaching experience) - 0.215(mobility) + 0.670(other experience) - 0.207(early educational experience) - 0.422(college type) + 1.810(GPA) - 4.450

correctly grouped 74.68% of the 233 cases.

Table 19 contains the results of the discriminant analysis in terms of both the standardized and nonstandardized coefficients. The values of the standardized coefficients indicate that GPA and Mobility were responsible for the majority of the differentiation with University Type contributing approximately one-half of either their values. The other three variables contributed little to the differentiation.

Classification functions were derived using the six variables. The coefficients for the derived functions for each group are listed in Table 20.

The equations formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

Table 19

Discriminant Analysis Coefficients for Female Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | 0.2869 | 0.0311 |
| Mobility | -0.6245 | -0.2148 |
| Other Experience | 0.2010 | 0.6701 |
| Early Ed. Experience | -0.1757 | -0.2074 |
| College Type | -0.3416 | -0.4216 |
| GPA | 0.7498 | 1.8101 |
| (Constant) | | -4.4504 |

Table 20

Classification Function Coefficients for LTS vs. MTS Female Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | -0.0999 | -0.0589 |
| Mobility | 1.7192 | 1.4362 |
| Other Experience | 24.2020 | 25.0851 |
| Early Ed. Experience | 2.8921 | 2.6188 |
| College Type | 3.1237 | 2.5680 |
| GPA | 16.3713 | 18.7568 |
| (Constant) | -55.3422 | -61.0993 |

## Data Analysis Relative to All Teachers

As seen in Table 21, the range of teaching experience for the 323 reporting teachers varies from 1 to 45 years, with a mean of 13.7 years. The average teacher had changed jobs 4 times with at least one teacher having changed jobs 18 times. The mean of 1.802 for other experience indicates that the average teacher did not have five years of more work experience outside of education.

Table 21

Descriptive Statistics of Selected Variables for All Teachers

| Variables | Mean | SD | Variance | Min | Max | Range |
|---|---|---|---|---|---|---|
| Teaching Experience | 13.666 | 8.985 | 80.733 | 1 | 45 | 44 |
| Mobility | 4.248 | 3.007 | 9.044 | 0 | 18 | 18 |
| Other Experience | 1.802 | 0.399 | 0.159 | 1 | 2 | 1 |
| Early Ed. Experience | 2.269 | 0.841 | 0.707 | 1 | 3 | 2 |
| College Type | 2.316 | 0.819 | 0.670 | 1 | 3 | 2 |
| GPA | 2.828 | 0.463 | 0.215 | 1.69 | 4.00 | 2.31 |

The reported mean (2.269) and standard deviation (0.841) for early educational experience means that the average teacher in the study graduated from high school in a mid-sized community whose population ranged from 10,000 to

100,000. However, more teachers finished high school in large metropolitan areas than in small rural areas.

More teachers attended competitive colleges than either more competitive or less competitive institutions as indicated by the 2.316 mean for college type. However, the statistics are skewed toward the less competitive value, which indicates that the teachers in this study attended less competitive colleges more often than more competitive institutions.

The range of the grade point averages varied from 1.69 to 4.00, with a mean of 2.828. Therefore, the average teacher had an overall GPA of C+ during the last two years of the bachelor's program.

An examination of the means and standard deviations of the six selected variables, as shown in Table 22, indicates that the average LTS teacher had about one-third more years of teaching experience, changed jobs two more times, and had a 0.32 lower GPA than the average MTS teacher. Neither the average MTS nor LTS teacher had five years or more work experience other than in education and both grew up generally in a mid-sized city. The LTS teachers' mean score for college type was slightly more skewed toward less competitive than was the mean score of the MTS group.

The DISCRIMINANT analysis began by choosing the single variable (GPA) which contributed most to differentiation and which had the smallest Wilks' lambda (0.876). Mobility, which in conjunction with the initial variable produced the smallest Wilks' lambda (0.812) was selected as the second variable. These two were then combined with each of the remaining variables and other experience was included third with the best remaining criterion value (0.774). College type was included fourth with criterion value of 0.757, and teaching experience was fifth with Wilks' lambda of 0.743. The F value for early educational experience was insufficient after step five to be included further in the analysis.

Table 22

Means and Standard Deviations of Selected Variables for All Teachers with Competency Group Membership as Criterion

| Variable | MTS Group M | MTS Group SD | LTS Group M | LTS Group SD |
|---|---|---|---|---|
| Teaching Experience | 13.494 | 8.023 | 13.847 | 9.924 |
| Mobility | 3.289 | 2.482 | 5.261 | 3.185 |
| Other Experience | 1.892 | 0.312 | 1.707 | 0.457 |
| Early Ed. Experience | 2.265 | 0.832 | 2.274 | 0.852 |
| College Type | 2.217 | 0.810 | 2.420 | 0.818 |
| GPA | 2.986 | 0.456 | 2.660 | 0.410 |

The five selected variables formed a significant discriminant function with a canonical correlation of 0.507, a Wilks' lambda of 0.743, and a chi-square of 94.453 with five degrees of freedom and significance of 0.0000. The nonstandardized equation

COMPETENCY RATING = 0.035(Teaching Experience) -
0.219(Mobility) + 0.917(Other Experience) -
0.362(University Type) + 1.561(GPA) - 4.774

correctly grouped 73.4% of the 323 teachers.

Table 23 contains the results of the analysis in terms of both the standardized and nonstandardized coefficients.

Table 23

Discriminant Analysis Coefficients for All Teachers

| Variable | Standardized Coefficient | Nonstandardized Coefficient |
|---|---|---|
| Teaching Experience | 0.3138 | 0.0349 |
| Mobility | -0.6241 | -0.2193 |
| Other Experience | 0.3568 | 0.9172 |
| College Type | -0.2948 | -0.3623 |
| GPA | 0.6780 | 1.5615 |
| (Constant) | | -4.7740 |

The values of the standardized coefficients indicate that mobility and GPA contributed the most to differentiation with each of the other variables contributing approximately one-half as much.

Classification function coefficients were derived using the five variables selected during the analysis process. The coefficients for each group are listed in Table 24.

The equations formed by using these coefficients could be used to classify unknown cases. The rule of assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

Table 24

Classification Function Coefficients for LTS vs. MTS Teachers

| Variable | LTS Coefficient | MTS Coefficient |
|---|---|---|
| Teaching Experience | 0.0196 | -0.0213 |
| Mobility | 1.2250 | 1.4820 |
| Other Experience | 16.9802 | 15.9053 |
| College Type | 3.0049 | 3.4295 |
| GPA | 18.9171 | 17.0872 |
| (Constant) | -50.4746 | -44.8990 |

## Summary

The mean scores of the selected variables for each of the seven groups, with competency group membership as criterion, are summarized in Table 25. The table also indicates which variables were selected as discriminators and the order of contribution to differentiation.

The variable mobility was selected either first or second during the discriminate analysis for each of the

Table 25

Mean Scores of Discriminating Variables and Order of Differentiation for Each of the Seven Groups Investigated

| Group Membership | Teaching Experience | | Mobility | | Other Experience | | Early Educational Experience | | University Type | | GPA | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MTS | LTS | MTS | LTS | MTS | LTS | MTS | LTS | MTS | LTS | MTS | LTS |
| Elementary | 12.959 *<br>(3) | 14.313 | 3.439 *<br>(2) | 4.844 | 1.878 | 1.906 | 2.286 | 2.266 | 2.388 *<br>(4) | 2.469 | 3.054 *<br>(1) | 2.655 |
| Secondary | 14.265 *<br>(5) | 13.527 | 3.074 *<br>(1) | 5.548 | 1.912 *<br>(2) | 1.570 | 2.235 *<br>(6) | 2.280 | 1.971 *<br>(3) | 2.387 | 2.889 *<br>(4) | 2.664 |
| Black | 15.578 *<br>(3) | 14.919 | 3.244 *<br>(1) | 5.014 | 1.933 | 1.838 | 2.578 | 2.554 | 2.844 *<br>(4) | 2.946 | 2.908 *<br>(2) | 2.609 |
| White | 12.719 *<br>(4) | 12.892 | 3.306 *<br>(1) | 5.482 | 1.876 *<br>(3) | 1.590 | 2.149 | 2.024 | 1.983 | 1.952 | 3.015 *<br>(2) | 2.706 |
| Male | 11.600 *<br>(2) | 12.527 | 2.743 *<br>(1) | 4.909 | 1.686 | 1.473 | 2.429 | 2.236 | 2.114 *<br>(4) | 2.327 | 2.930 *<br>(3) | 2.762 |
| Female | 14.000 *<br>(4) | 14.559 | 3.435 *<br>(2) | 5.451 | 1.947 *<br>(5) | 1.833 | 2.221 *<br>(6) | 2.294 | 2.244 *<br>(3) | 2.471 | 3.001 *<br>(1) | 2.606 |
| All Teachers | 13.494 *<br>(4) | 13.847 | 3.289 *<br>(2) | 5.261 | 1.892 *<br>(3) | 1.707 | 2.265 | 2.274 | 2.217 *<br>(5) | 2.420 | 2.986 *<br>(1) | 2.660 |

*Variables selected as discriminators.

(#) The numeral indicates the order of importance in reference to the amount of differentiation.

seven groups studied. LTS members changed jobs approximately two more times, on the average, than did MTS members for each group.

GPA was also high in order of contribution to differentiation for each of the seven groups. It was ranked first with elementary, female, and all teachers; second with black and white teachers; third with male teachers; and fourth with secondary teachers. The mean GPA for MTS group members was higher than for LTS group members for each of the seven groups.

The numbers of years of teaching experience a teacher had when identified for the study contributed to differentiation in each of the seven study groups. The average LTS teacher had more experience than the average MTS teacher in the elementary, white, male, female, and all teacher groups. The MTS teacher had more experience in the secondary and black groups.

The type of college the teacher attended contributed to differentiation for each of the groups with the exception of the white teacher group. The lower mean score for the MTS teacher in each group, as compared to the LTS teacher, indicates that the MTS teacher attended a competitive or more competitive college more often than did the LTS teacher.

The fact that a teacher had worked five years or more in occupations other than education was a selected variable in four of the seven groups: secondary, white, female, and all teachers. In each of the four groups the LTS teacher was more likely to have had other experience than the MTS teacher.

Early educational experience, as measured by the size of the community from which the teacher graduated from high school was selected in only two cases: secondary and female. The variable was selected sixth in both cases and the power of differentiation was small compared to the other selected variables.

# CHAPTER V
# SUMMARY, FINDINGS, CONCLUSIONS, DISCUSSION, AND SUGGESTIONS FOR FUTURE RESEARCH

## Summary

The purpose of the study was to distinguish between less-than-satisfactory (LTS) teachers and more-than-satisfactory (MTS) teachers based upon educational, experiential, and demographical variables that would be readily discernible at the time of initial employment. The following specific questions were addressed:

1. To what extent do the selected variables discriminate between LTS and MTS elementary teachers?
2. To what extent do the selected variables discriminate between LTS and MTS secondary teachers?
3. To what extent do the selected variables discriminate between LTS and MTS black teachers?
4. To what extent do the selected variables discriminate between LTS and MTS white teachers?
5. To what extent do the selected variables discriminate between LTS and MTS male teachers?
6. To what extent do the selected variables discriminate between LTS and MTS female teachers?
7. To what extent do the selected variables discriminate between LTS and MTS teachers?

The participants for the study were identified from classroom teachers employed by the Duval County Public School System, Jacksonville, Florida, during the four school terms 1981-82, 1982-83, 1983-84, 1984-85. The teachers were classified into one of two competency groups, less-than-satisfactory or more-than-satisfactory. A teacher who had received an unsatisfactory evaluation during one of the four years of the study was classified as LTS. MTS was assigned to a teacher who had been named "Teacher of the Year" for their school during any one of the four years of the study.

The discriminating variables selected to use in the study were GPA--the grade point average earned by the teacher during the last six quarters or four semesters of the bachelor degree; teaching experience--the number of years of full-time classroom teaching experience completed by the teacher when identified for the study; other experience--whether or not a teacher had worked in an occupation other than education for five or more years; mobility--the number of times the teacher had changed jobs; early educational experience--the size of the community from which the teacher graduated from high school; and college type--whether the admission requirements of the university from which the teacher completed the bachelor's degree were more competitive, competitive, or less competitive.

These variables were chosen as likely discriminators because each was mentioned as a possible contributor to teacher competency in one or more studies investigated during the review of the literature. Also, since the data describing the variables are routinely collected during pre-employment activities by members of the personnel office of the DCPSS, the writer questioned whether the data were useful for predicting teaching success.

The employment practices used by the DCPSS sought an optimal balance among black, white, male, female, elementary, and secondary employees. Each of these subgroups were therefore investigated separately as well as the total group of identified teachers.

Discriminant analysis was used to determine how well the set of variables discriminated between the MTS and LTS teachers in each of the seven groups mentioned above. A discriminant function was derived in each of the seven cases using the significant variables that discriminated between the MTS and LTS groups to a meaningful degree. In addition to the function, the analysis provided the statistical significance of the individual variables which provided the relative contribution of each variable to the separation of the groups.

Once a set of variables was found that provided satisfactory discrimination for the LTS and MTS groups, classification functions for each group were derived which could permit the classification of new teachers. Assigning a case to the group with the highest score is equivalent to assigning the case to the group for which it has the greatest probability of membership.

## Findings

When elementary teachers were examined as a group, four of the six variables satisfied the criterion (1.0 or greater for the value of the F ratio) for selection as useful discriminators. The selected variables were GPA, mobility, teaching experience, and college type, with GPA contributing most and college type least to the separation of the groups. Other experience and early educational experience were excluded from the analysis since they did not provide a minimum level of discrimination. The discriminant function that was derived using the four significant variables, correctly grouped 71% of the elementary teachers. Classification functions were derived for each of the MTS and LTS elementary teacher groups, using the four significant variables, which could be used to classify new cases.

All six of the discriminating variables were selected during the data analysis for secondary teachers. The function derived using the six variables correctly grouped 79% of the secondary teachers. Mobility and other experience contributed most to the separation of the groups while early education experience contributed least. Classification functions were derived for each of the MTS and LTS secondary groups which could be used to classify new cases.

Of the four variables selected when analyzing the data for black teachers, mobility and GPA contributed most to separation. Other experience and early educational experience did not satisfy the criterion for selection for this group of teachers. The four discriminating variables formed an equation that correctly grouped 74% of the black teachers. Classification functions were derived for the MTS and LTS groups of black teachers which could be used to classify new cases.

Mobility, GPA, other experience, and teaching experience were found to be satisfactory discriminators during the examination of the data of white teachers. The discriminant function using these variables correctly grouped 75% of the white teachers. Mobility contributed most to differentiation with GPA and other experience following closely in the amount of contribution. College type and early educational experience were not selected as useful discriminators for this group of teachers. Classification functions were derived which could be used to classify new cases into MTS or LTS groups.

For male teachers, the four variables found to have useful discriminating power were mobility, teaching experience, GPA, and college type. Mobility contributed by far the most to separation of the MTS and LTS groups. The other three selected variables together contributed less than mobility. The discriminant function derived, using the four selected variables, correctly grouped 62% of the male teachers. This function provided the least accurate grouping of any of the other discriminant functions for other subgroups. Classification functions were derived which could be used to classify new male teachers into MTS or LTS groups.

All six of the variables were selected when analyzing the data for female teachers. The discriminant equation derived using all six of the variables correctly grouped 75% of the cases. GPA and mobility were found to contribute most to the separation of the MTS and LTS groups, while early educational experience contributed the least. Functions were derived which could be used to classify new females into MTS or LTS groups.

When the data for all the 323 teachers identified for the study were used, only one of the variables (early educational experience) was not selected as a useful discriminator. Of the five variables selected, mobility and GPA contributed most to the separation of the MTS and LTS groups. The function derived using the five variables correctly grouped 73% of all the teachers. Functions were derived which could be used to classify new teachers into MTS or LTS groups.

## Conclusions

For each of the subgroups of teachers studied, the following conclusions were drawn from the results of this study.

1. Selected educational, experiential, and demographical variables discriminate between LTS and MTS elementary teachers. Specifically, a linear combination of GPA, mobility, teaching experience, and college type correctly grouped members of the two groups with 71% accuracy.

2. Selected educational, experiential, and demographical variables discriminate between LTS and MTS secondary teachers. Specifically, a linear combination of teaching experience, mobility, other experience, early educational experience, college type, and GPA correctly grouped members of the two groups with 79% accuracy.

3. Selected educational, experiential, and demographical variables discriminate between LTS and MTS black teachers. Specifically, a linear combination of mobility, GPA other experience, and early educational experience correctly grouped members of the two groups with 74% accuracy.

4. Selected educational, experiential, and demographical variables discriminate between LTS and MTS white teachers. Specifically, a linear combination of mobility,

GPA, other experience, and teaching experience correctly grouped members of the two groups with 75% accuracy.

5. Selected educational, experiential, and demographical variables discriminate between LTS and MTS male teachers. Specifically, a linear combination of mobility, teaching experience, GPA, and college type correctly grouped members of the two groups with 62% accuracy.

6. Selected educational, experiential, and demographical variables discriminate between LTS and MTS female teachers. Specifically, a linear combination of mobility, GPA, other experience, teaching experience, college type, and early educational experience correctly grouped members of the two groups with 75% accuracy.

7. Selected educational, experiential, and demographical variables discriminate between LTS and MTS teachers. Specifically, a linear combination of mobility, GPA, other experience, teaching experience, and college type correctly grouped members of the two groups with 73% accuracy.

## Discussion

The results of this study showed that certain educational, experiential, and demographical facts concerning less-than-satisfactory and more-than-satisfactory teachers could be used successfully to place them into competency groups. The accuracy of placement ranged from 62% to 79%

depending on the subgroup of teachers being examined. These findings could provide some assistance for principals and personnel administrators in selecting teachers for their districts.

Two variables in particular proved to be effective discriminators between the LTS and MTS groups. The number of times a teacher changed jobs and the grade point average during the final two years of the bachelor's degree were strong indicators of differentiation between the MTS and LTS groups for each of the seven subgroups of teachers. One would be prudent then to use mobility and GPA as a portion of the selection data, particularly for applicants who have had prior experience.

To a lesser degree, the number of years of teaching experience and, except for white teachers, the competitiveness of the entrance requirements of the college attended also provided useful differentiation. As final hiring decisions are made, these two should be added to the selection data.

At this point a caveat must be introduced. In the Duval County Public School System, the number of teachers identified as LTS during any one of the years reported in this study amounted to less than 1% of the total teacher employed. Also, the largest number of teachers identified as LTS, from those hired during any one of the four years of the study, occurred at the conclusion of the 1982-83 school year.

During that year, 19 of the 421 teachers hired, or 4 1/2% were rated LTS by their principals. This would imply that hiring practices at the time of this study were at least 95% successful when considering all teachers--a considerable improvement over the approximate 75% accuracy rate of the discriminating functions derived for the relatively small groups of MTS and LTS teachers. The large group of teachers who were in neither the MTS nor the LTS groups were not included in this study, and therefore, their classifications using the derived discriminating functions are unknown.

In this study the writer attempted to identify file data that accounted for teacher competency ratings. The results should be used with caution and only as a supplement to hiring practices already in existence.

## Suggestions for Future Research

The results of this research indicated that certain educational, experiential, and demographical information concerning less-than-satisfactory and more-than-satisfactory teachers is useful for prediction of group membership. Because of the limitations listed in Chapter I of this study and of the concerns cited in the discussion section of this chapter, the following suggestions for additional study were offered.

1. Since the variables chosen for this study were generally useful in terms of differentiation,

replication of this study using other data that are readily available at the time of initial employment may be warranted. Such data may include the extent of extra curricular activities during high school and college, the number of brothers and sisters in the family, amount of graduate level education, applicant's sense of efficacy, etc.

2. Since only less-than-satisfactory and more-than-satisfactory teachers were investigated, replication of this study using a random sample of teachers who were in neither the MTS nor LTS groups may be warranted. These "average" teachers could be treated as a separate third group, or if the variables failed to significantly differentiate, they could be lumped with the MTS to see if the amount of differentiation increased or decreased using the expanded MTS group.

3. The average amount of teaching experience for both the MTS and LTS groups was between 13 and 14 years. This indicates that teachers are being identified as LTS after considerable years of experience. A replication of this study after separating experienced teachers from beginning teachers may be warranted. Why are teachers being identified as unsatisfactory after 13 years of experience? A search for the answer to the question may lead to a research project of significant importance.

4. The result of the initial pre-employment interview for each of the teachers investigated in this study was not available. A replication of this study using a pre-employment interview rating in addition to the educational,

experiential, and demographical information available at the time of initial employment would be warranted. Teacher employment is currently based mainly on the results of the initial interview. If it were found that the selected variables increased the already high incident of satisfactory teacher employment, then the discriminating functions derived would be powerful tools in the selection process.

# REFERENCES

Adler, M. J. (1982). *The Paideia proposal*. New York: Macmillan.

American Association of Colleges for Teacher Education. (1985). *A call for change in teacher education* (ISBN-0-89333-035-3). Washington, DC: Author.

Bell, T. H. (1983). Building a better teaching profession. *American Education*, *19*(2), 2-4.

Berry, B. (1984). *A case study of the teacher labor market in the southeast. Miss Dove is alive and well (and teaching math, sponsoring the yearbook, and coaching softball)*. Research Triangle Park, NC: Southeastern Regional Council for Educational Improvement. (ERIC Document Reproduction Service No. ED 251 967)

Bloland, P. A., & Selby, T. J. (1980). Factors associated with career choice among secondary school teachers: A review of the literature. *Educational Research Quarterly*, *5*, 13-23.

Brodinsky, B. (1979). Ma Haynes of old Saybrook. *Today's Education*, *68*(1), 62-64.

Brooks, P. A. (1967). Teacher selection practice in Texas public schools (Doctoral dissertation, North Texas State University, 1967). *Dissertation Abstracts International*, *28*, 3405A. (University Microfilms No. 68-2767)

Cook, W. W., Kearney, N. C., Rocchio, P. D., & Thompson, A. (1956). Significant factors in teachers' classroom attitudes. *Journal of Teacher Education*, *7*, 274-279.

Coventry, W., & Burstine, I. (1977). *Management: A basic handbook*. Englewood Cliffs, NJ: Prentice-Hall.

Cubberly, E. P. (1920). *The history of education*. Boston: Houghton Mifflin.

Davis, E. D. (1966). *Focus on secondary education*. Glenview, IL: Scott, Foresman.

Denton, J. J., Kracht, J. B., & McNamara, J. F. (1977). *Do teachers make a difference in teaching law related topics in social studies*? Law-focused workshops conducted in various locations in Texas. (ERIC Document Reproduction Service No. ED 175 754) *

Doty, B. A. (1970). Predictions of teaching effectiveness of women who begin teaching after age thirty-five. Journal of Teacher Education, 21, 519-525.

Education Commission of the States' Task Force for Economic Growth. (1983). Action for excellence. Denver: Hirschfeld Press.

Eissey, E. M. (1967). Selected variables in teaching preparation and subsequent evaluation of teaching performance. Dissertation Abstracts International, 28, 2115A-2116A. (University Microfilms No. 67-8466)

Frankel, M. L., & Gerald, D. E. (1980). Projections of educational statistics to 1988-89. Washington, DC: National Center for Education Statistics, U. S. Department of Education.

Getzels, J. W., & Jackson, P. W. (1963). The teacher's personality and characteristics. In N. L. Gage (Ed.), Handbook of Research on Teaching. Chicago: Rand McNally.

Gurney, D. W. (1977). Judging effective teaching. Phi Delta Kappan, 58, 774-775.

Guthrie, J. T. (1982). Teaching effectiveness: The quest for refinement. The Reading Teacher, 35, 636-638.

Hanushek, E. (1970, February). The production of education, teacher quality and efficiency. Paper presented at the Bureau of Educational Personnel Development Conference, Washington, DC. (ERIC Document Reproduction Service No. ED 037 396)

Hathaway, W. E. (1980). Testing teachers. Educational Leadership, 38, 210-215.

Hensen, K. T. (1980). The effects of certain selected variables in student teachers' preparatory programs on the levels of attainment of their students. Paper presented at the annual meeting of the Southwest Educational Research Association. (ERIC Document Reproduction Service No. ED 183 532)

Husen, T., Saha, L. J., & Noonan, R. (1978). Teacher training and student achievement in less developed countries. World bank staff working paper No. 310, World Bank, Washington, DC. (ERIC Document Reproduction Service No. ED 199 811)

Kearney, N. C., & Rocchio, P. D. (1955). The relation between the Minnesota Teacher Attitude Inventory and subject matter taught by elementary teachers. *Educational Administration and Supervision*, *41*, 358-360.

Kelly, N., & Kelly, B. (1982, November). *Backgrounds, education, and teaching styles of teaching award winning professors*. Paper presented at the Annual Meeting of the Rocky Mountain Educational Research Association, Albuquerque, NM. (ERIC Document Reproduction Service No. ED 230 080)

Klecka, W. R. (1975). Discriminant analysis. In N. Nie, C. Hull, J. Jenkins, K. Steinbrenner, & D. Bent (Eds.), *SPSS* (2nd. Ed.) (pp. 434-467). New York: McGraw-Hill.

Koerner, J. D. (1963). *The miseducation of American teachers*. Boston: Houghton Mifflin.

Kounin, J. S. (1970). *Discipline and group management in classrooms*. New York: Holt, Rinehart, & Winston.

Legal service breakdown by division. (1985). [Summary of monthly cost of legal services for Duval County Public School System]. Unpublished raw data.

Levin, H. M. (1970). A cost-effective analysis of teacher selection. *Journal of Human Resources*. *5*, 25-33.

Mariner, J. L. (1978). Teaching biology at the secondary level. *American Biology Teacher*, *40*, 148-149.

May, R. E., & Doerge, E. G. (1972). *An analysis of the informational items and procedures used in the selection of teachers in the public school system of Louisiana*. A paper prepared for the National Center for Educational Research and Development under contract No. OEC-6-72-733(509). (ERIC Document Reproduction Service No. ED 070 180)

Moriarty, T. E. (1981). Unique qualities of rural teachers in Western South Dakota. *Small School Forum*, *2*(3), 29-31.

Moskowitz, H. J. (1980). An investigation of the differential effects of male and female teachers on primary pupils' mathematics and reading acheivement. *Dissertation Abstracts International*, *41*, 1388A.

Murnane, R. J. (1975). *The impact of school resources on the learning of inner city children*. Cambridge, MA: Ballinger.

Ornstein, A. C. (1976). Can we define a good teacher? *Peabody Journal of Education*, *53*, 201-207. *

Pavalko, R. M. (1970). Recruitment to teaching: Patterns of selection and retention. *Sociology of Education*, *43*, 340-355. *

Perkes, V. A. (1967). *Junior high school teacher preparation, teaching behaviors, and student achievement*. Stanford, CA: Stanford University. (ERIC Document Reproduction Service No. ED 0254 417)

Personnel records. (1985). [School board agendas and applicants' files of the Duval County Public School System]. Unpublished raw data.

Quick, T. J., Witten, B. J., & Weinberg, S. F. (1973). Review of studies of the concurrent and predictive validity of the National Teacher Examination. *Review of Education Research*, *43*(1), 89-113.

Reagan, B. R. (1983). Quality assurance in education: Borrowing a lesson from business. *American Education*, *19*(4), 19-22.

Ryan, K., & Phillips, D. H. (1982). Teacher characteristics. In H. E. Mitzel, J. H. Best, & W. Rabinowitz (Eds.), *Encylcopedia of eduational research* (5th ed.), New York: MacMillan. *

Ryans, D. G. (1960). *Characteristics of teachers*. Washington, DC: American Council on Education.

Schlechty, P. C., & Vance, V. S. (1983). Recruitment, selection, and retention: The shape of the teaching force. *The Elementary School Journal*, *83*, 469-487.

Sharp, L. M., & Hirshfield, S. B. (1975). *Who are the new teachers? A look at the 1971 college graduates*. Washington, DC: Bureau of Social Science Research.

Skipper, C. E. (1975). Predicting effective teaching using academic achievement and attitudes. *Kappa Delta Pi Record*, *12*(2), 38-40. *

Solorzano, L. (1983, March 14). What's wrong with our teachers. *U. S. News & World Report*, pp. 37-40.

Stevens, D. (1979). A study of relationships between prospective teacher selection and student-teacher performance. *Dissertation Abstracts International*, *39*, 4193A-4194A. (University Microfilms No. 79-003 58)

Stewart, D. (1982). Schools of teacher education should be eliminated. *English Journal*, *71*(8), 10-13.

Sykes, G. (1983). Teacher preparation and the teacher workforce: Problems and prospects for the 80s. *American Education*, *19*(2), 23-30.

Tanner, C. K., & Ebers, S. M. (1985). Factors related to the beginning teacher's successful completion of a competency evaluation. *Journal of Teacher Education*, *36*(3), 41-43.

Trentham, L., Silvern, S., & Brogdon, R. (1985). Teacher efficacy and teacher competency ratings. *Psychology in the Schools*, *22*, 343-352.

Twentieth Century Fund. (1983). *Making the grade*. New York: Author.

United States National Commission on Excellence in Education (1983). *A nation at risk: The imperative for educational reform*. Washington, DC: Author.

Walberg, H. J. (1967). Scholastic aptitude, the National Teacher Examinations, and teaching success. *Journal of Educational Research*, *61*, 129-131.

Waller, W. (1965). *The sociology of teaching*. New York: Russell & Russell. (Originally published 1932)

Watkins, B. (1981). Schools of education tightening programs in response to attacks on teacher training. *Chronicle of Higher Education*, *22*(2), 1, 10.

Weaver, T. (1983). *America's teacher quality problems: Alernatives for reform*. New York; Praeger.

Weaver, W. T. (1979). The need for new talent in teaching. *Phi Delta Kappan*, *61*, 29-46.

Weber, C. A. (1954). *Personnel problems of school administrators*. New York; McGraw-Hill.

371.1 W373p

Weslander, D., & Arnsdorf, V. (1982, November). *Profile of an effective social studies teacher*. Paper presented at the Annual Meeting of the National Council for the Social Studies, Boston. (ERIC Document Reproduction Service No. ED 224 750)

Williamson, J. A. (1969). Biographical factors and teacher effectiveness. The Journal of Experimental Education, 37(3), 85-88.

Zirbel, H. E. (1980). Good teachers: Our most essential artisans. Vocational Education, 55(6), 18-20.

# BIOGRAPHICAL SKETCH

Dalton D. Epting was born April 28, 1940, in Hilliard, Florida. He attended public schools in Hilliard and Jacksonville, Florida, and was graduated from Hilliard High School in 1958. He received his Bachelor of Science degree in mathematics from Stetson University in 1962, and his Master of Science in mathematics from Florida State University in 1968.

After serving as an officer in the United States Army for three years, he began his teaching career in the fall of 1965, in Duval County, Florida. His first assignment was at Wolfson High School as a mathematics instructor and basketball coach. Other professional experience in Duval County includes assistant principal for curriculum at Terry Parker High School, vice principal at Robert E. Lee High School, principal of both Paxon and Englewood High Schools, and director of personnel for the county school system. In August, 1986, he was appointed principal of Fletcher Senior High School in Neptune Beach, Florida.

Mr. Epting has been active in teacher organizations including the Duval, Florida, and National Councils of Teachers of Mathematics. He is a member of Phi Delta Kappa, Duval County Secondary Principals Association, Florida Association of School Administrators, National Association of

Secondary School Principals, and American Association of School Personnel Administrators. He has served on committees at the state and local levels and is a past president of both the Duval County Council of Teachers of Mathematics and the Duval County Secondary Principals Association.

Mr. Epting's wife, Carolyn, is also employed by the Duval County School Board as a school counselor. They have a son, William, age 22, and a daughter, Claudia, age 19.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Ralph B Kimbrough

Ralph B. Kimbrough, Chairman
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

Michael Y. Nunnery
Professor of Educational
Leadership

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Education.

David A. Jacobsen
Professor of Educational
Leadership

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Education.

December, 1986

David C. Smith (N)

Dean, College of Education

Dean, Graduate School